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AUGUST 1981

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National Microtech, Inc. continues to sell more home satellite antenna systems than anyone in the world. Microtech's new Apollo™ is so far advanced over our competition-in features, performance, and cost- that we feel Apollo™ is destined to become a legend in the satellite industry. If you are interested in buying or selling Apollo™ systems, give us a call today. Remember, no one sells the Apollo™ but Microtech dealers and distributors. See the legend today.

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COOP'S COMMENT ON TECHNOLOGY

CHANGES AND MORE CHANGES

Anyone getting into the satellite TV business had better be able to adapt quickly to change, or his (or her) tenure in this field will be very short indeed. If the changes in programming sources doesn't get you, the changes in birds will. And if neither of those concern you too much, the rapid rise in new technology can make you or break you in this business almost overnight.

The forthcoming SPTS '81 is a good case in point. One of our feature reports this month talks (as much as we are being allowed to talk) about an entirely new concept in 'shared terminals'. All of you who have been wishing there was an **inexpensive** way to tie 2, 200 or 2,000 individual sets to the same antenna and to give **each** set totally **independent access** to all 20 (23 or 24) transponders on a single satellite will find the report here, plus the demonstration in Omaha, a giant leap forward in new technology.

If selling terminals to people who want to see the results on more than one TV at a time isn't up your antenna, perhaps a new package from Robert Luly & Associates will be. You remember Bob Luly; he's the chap who created the Umbrella Antenna we all eyeballed first in San Jose at SPTS '80. You may also remember that Bob suggested that the carry-it-anywhere Umbrella Antenna **should be** sheltered from the wind since it acts like a sail in a breeze (see **CSD** for June 1981; page T4). Well, young Robert has solved that one. He'll show off a new version of the Umbrella that doesn't blow away in the wind although it still folds up like the first version. And if that isn't good news (it is to me; I spend far more time putting up the J.C. Penny tent that we cover ours with than I do unfurling the antenna, mounting it on a tripod mount, connecting up the LNA and finding signals), well, the "LNA in the feed" he has created for this portable (or permanent, now) antenna system should catch your attention. Oh yes, for those who have his first version, a factory retrofit to the new 'windproof' version is available.

At Omaha the industry is going to see its first 'made-for-private terminals' piece of test equipment. Taylor Howard is behind this one; an instrument that you can set up out by your TVRO antenna and then check out (and calibrate) your antenna, LNA and receiver. How many times have you swept back and forth across the sky looking for a bird to hang your hat on, only to later discover you had a bum power cable connection, or a bad LNA? How many times have you wished you could compare receivers for sensitivity without complicated and time consuming "A" / "B" testing with splitters and monitors? Its nice to see the industry growing up enough to realize that it needs some accurate, specialized test equipment.

There have been other, more subtle creations in the past month or so. For example, have you noticed that WTBS has broken away from the mold of starting new programs on either the hour or half hour.? Since June 29th new programs now begin at 5 past and 35 past the hour. One might ask why. Ted Turner says he wants his station to stand out as a true alternative viewing choice. Apparently he figures that people can now get into a program on a competitive channel by 5 minutes or so, decide they don't care for it, and switch to WTBS without fear of missing the start of his programming. I suspect he will also enjoy having his own single-line entry in the various **TV Guides** that carry WTBS listings. This could lead to a whole new trend in programming. If five past the hour and half hour is good, why not make it ten past to stay a step ahead of fast Ted? And if that works, why not go to the quarter hour point? As any experienced Molniya watcher can tell you, Russian TV doesn't pay much attention to the clock either. Programs run as long as it takes to tell the story and then if they don't have a convenient length program to follow directly, they run a test pattern and play music until some reasonable new start point comes along on the clock. You can always switch over to transponder 11 on FI and watch a few minutes of Warner's new Music Channel which features 'Video Disc Jockies'. I can't wait to see how long Turner sticks with this 'programming innovation'. Heaven help us all if it catches on!

OUR COVER -

The sand dune behind the WIV Annex on Provo is constantly changing. The most recent additions have been a ten foot SatFinder and a six meter Hero "Super 'Tenna"; both motorized of course. We'll have reports on the performance (and assembly) of both over the next few months. A ten footer in the Caribbean? Yes indeed!

CSD TECHNOLOGY

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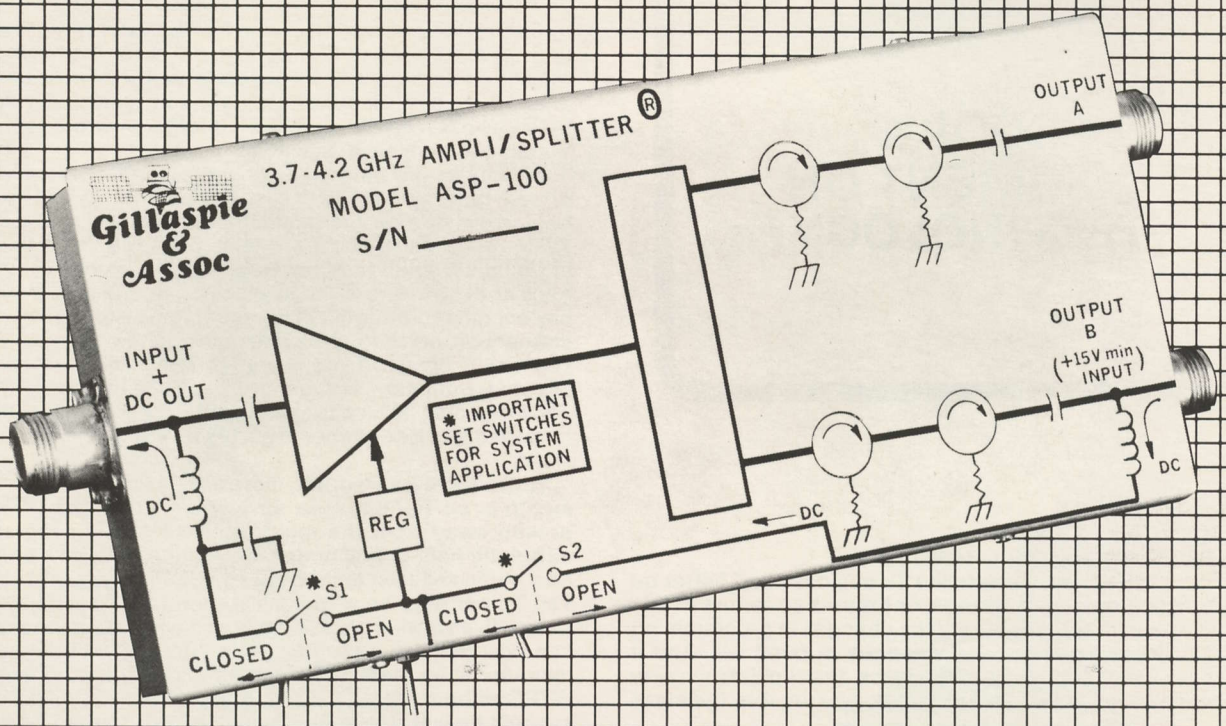

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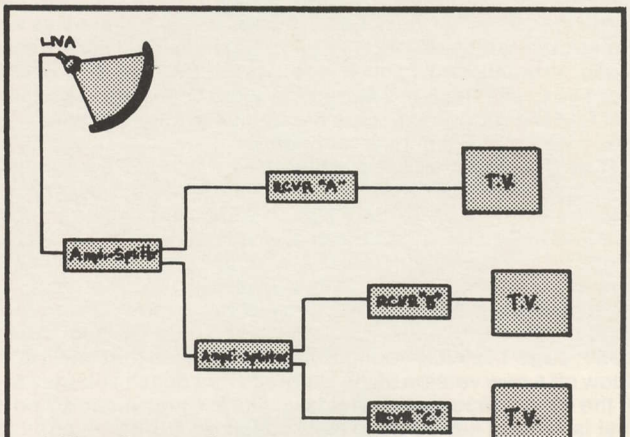

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Get the Last Word FIRST!

SCDN SPELLS TOTAL FREEDOM

WATCH - BUT DON'T TOUCH

In the July issue of **CSD** we wrote of a rather startling new technology breakthrough which we have been privileged to witness in operation back in May. You may recall that this is an entirely new approach to TVRO receive **electronics**; one that does away with many of the "taboos" associated with any and every type of satellite video receiving system previously developed and brought to the marketplace.

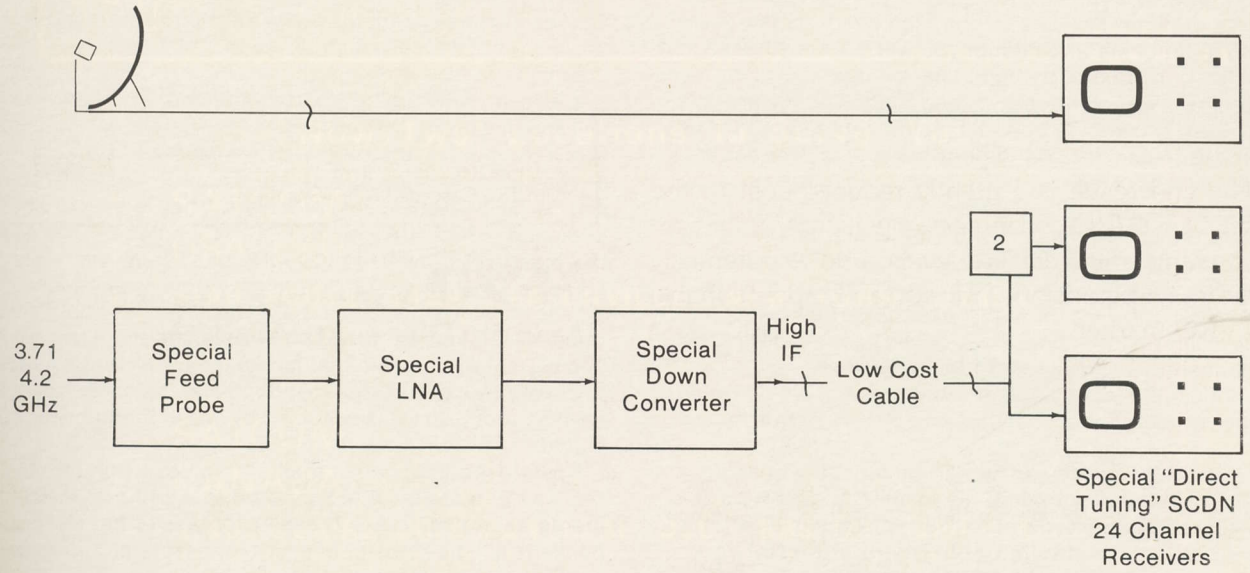
This particular system is, I would judge, someplace around 80% mature. That means in the real world that it does everything the designer(s) set out to do but there are refinements still going on which will ultimately improve the outstanding performance I witnessed in May just a smidgen more, and, which will also make the package as it is released into the marketplace a more versatile tool for the installing dealer/distributor. This report is written directly to the professional in this field; the person or firm who buys satellite hardware directly from the original equipment manufacturer and who in turn sells it as an installed package of equipment to the end user. There is nothing in this particular new technology for the do-it-your-selfer, excepting perhaps the opportunity to witness an entire new direction in low cost satellite receiving systems being born.

First of all, we now have the promise of the system developers that it **will be shown** for the first time in public, in Omaha. Getting that agreement worked out has been a passion for us since we first saw it in May. At first there was genuine reluctance to show off the equipment "in the North American market..." since the developing firm did not intend to sell the satellite hardware in **this** market for some years. As this is written, that is still their official 'line' although I believe I may detect some waivering on this point, and **perhaps** if the reaction is good in Omaha, a decision to offer it here may follow.

Here is what the new technology accomplishes:

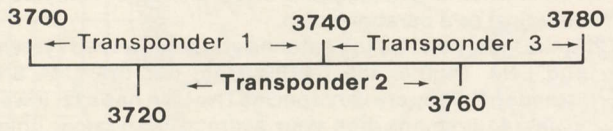
1) You start off with a standard TVRO antenna. It may be a spherical or a parabolic dish.
2) At the focal point for the antenna you place a feed system and LNA. Neither the feed system nor the LNA are "standard". They are very special. The LNA has a far lower 'gain' requirement than your average LNA (most units now in use have 50 dB of gain), and inside of the LNA container you have a quite unusual downconverter arrangement. The special feed does something quite novel; it picks off both the vertical and the horizontal polarized signals simultaneously and feeds them through the single 'stripped down' LNA to the special downconverter.
3) Coming out of the downconverter we have the whole 500 MHz wide spectrum of the TVRO band (3.7 to 4.2 GHz input), in a similar 500 MHz segment falling "someplace in the upper VHF-UHF spectrum". This is your "IF" signal, and as it leaves the downconverter on typically low cost cable (RG-59/U, RG-6, etc.), **all** of the **vertical** and **all** of the **horizontal** signals are now 'married together' **and equal in signal strength.**

At this point a quick review of some fundamentals is in order. RCA SATCOM and COMSTAR birds are 24 channel because they interleave a maximum of 12 vertically polarized transponders with a maximum of 12 horizontally polarized transponders. The odd (vertical) transponders are 'frequency



BASIC SCDN SYSTEM

offset' from the horizontal (even) transponders by **half** a channel width. You can, for example, turn the feed on your own antenna to approximately half way between the proper vertical and horizontal settings and tune your receiver through the dial and pick up (**all mixed up together**) both polarizations. It **looks** as if you **should** be able to park the feed in this half way position and not have to worry about rotating the feed; **if only** you could figure out a way to tune in transponder 2 (for example) and not have **parts of** transponders 1 and 3 sliding across the picture tube!



Remember - 50% of transponder 2 is occupied by transponder 1, 50% by Transponder 3.

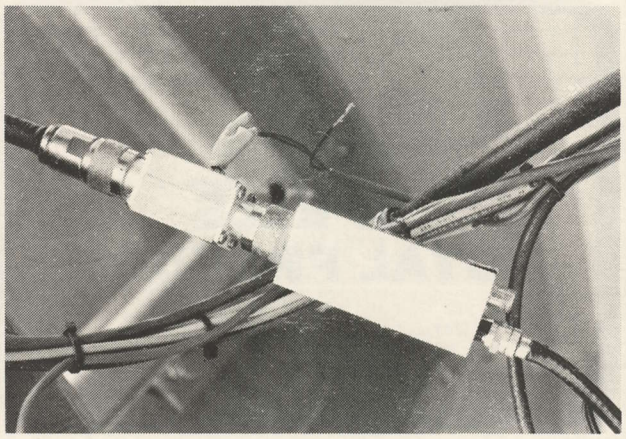
Back to our new technology. We know of several people who have attempted to design a receiver that would work with a feed probe 'parked' between the two polarizations. There is **some logic** to suggest that if you could narrow up the low frequency IF response to say 18 or 20 MHz, you could select transponders 1,2,3,4 and so on in sequence without having the two immediately adjacent transponders throwing garbage into your desired transponder video. While it **might** be possible to design an extremely sharp IF bandpass filter that could accomplish this miracle (and thereby give you **all** 24 channels without polarization switching), to the best of our knowledge nobody has done it yet in a satisfactory manner.

But our new technology to be seen in Omaha has accomplished the same end result none the less. **How they do it** is of course extremely private information. Wild horses could not drag it out of me and I doubt you will learn it yourself in Omaha; so don't bother trying to figure it out.

4) After the magic of the special feed and downconverter we have the whole TVRO band spectrum spread out for us within a piece of coaxial cable. Since the coaxial cable is low cost (under ten cents a foot in quantity), and since the signals are being transported as a 'balanced' group within the cable, in a portion of the spectrum (i.e. below 1,000 MHz) where relatively low cost "CATV type line amplifiers" can be employed to boost the signal when it gets weak traveling through the cable, we have an instant way of inter-connecting up two or two hundred or virtually any quantity of TV receivers to the service.

Now if this technology had stopped there, it would be an outstanding contribution to the way we do things. But there is more.

5) The in-cable service can be carried around a building, a neighborhood or an entire community. It gets from the TVRO receiving site to each 'outlet location' in what is being called a "**Satellite Cable Distribution Network**". For someplace between $5,000 and $7,000 per mile of "SCDN" cable plant you can pipe the network where you want it. **Individual** homes, rooms or whatever are tapped into the "SCDN" cable, using very conventional CATV type tap off equipment. You can run one 'drop line' into a home and then wire up every room in the home, if you wish, with outlet jacks. The cost per outlet, on top of the cost of the "SCDN" cable plant will be around $40 to $50.



MAGIC BOX - 4 GHz satellite signal comes in from right, goes through LNA power 'coupler' (left) and then into special polarization-balancing downconverter (rectangular housing to right). Signal(s) to receivers is fed via low cost 59 type cables.

This means that if you have 100 homes that can be served in a mile of cable, and each home has a single outlet, you will spend $6000 (half way between $5000 and $7000) plus another $4500 (half way between $40 and $50, times 100) to connect up each house. So for the cost of the '**Master SCDN Terminal**' (around $15,000), plus another $10,500, you have 24 channels of satellite TV into 100 separate homes. That works out to $25,000 or so in our example, which divided by 100 homes comes to **$250 per home**. Remember - **each home will have unlimited access to any of the** (up to 24) **transponders on the bird!**

Now we are as far as the inside of each home (or each motel room for example). What happens inside one might ask? Obviously these satellite TV signals cannot be displayed on an ordinary TV receiver!

Surprise.

We have saved the best part for the end. The receivers you will see displaying the full range of FI signals will look, smell, feel and operate **like** ordinary television receivers. You will not be able to look inside of them, of course, because they are **not** "ordinary" television receivers. They are very special, designed to function with the "SCDN" package. They accept the high-VHF / low-VHF 500 MHz band from the cable line and do something which or "ordinary" television receiver can do; the individual transponders fall in place, one right after the other. When you are tuned into transponder 7, for example, you are not even aware that half of the transponder space is occupied by a part of transponder 6 and the other half of the transponder 7 space is occupied by half of the transponder 8 signal.

Now we reported earlier that this project is perhaps 80% of the way to maturity. And we noted that some of the refinements ahead will make it easier for you to handle the full package line as a dealer or distributor. Here are some of the areas this impacts upon:

1) **The "SCDN" Slave Receivers** you will see are packaged as small black and white portables. The picture and

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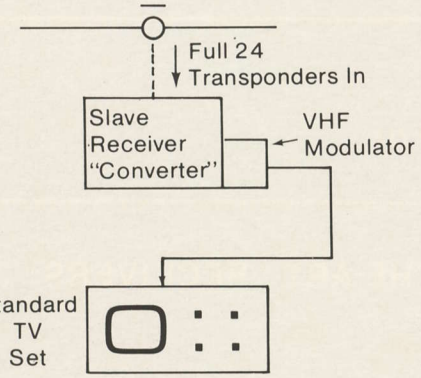
sound coming out of the 'Slave Receivers' is perfectly adequate but most people would prefer to have it in color and on a big screen (remember that this particular company perceives the marketplace to be 'off-shore' from the USA, and in areas where satellite TV will be the **first TV** of any kind; areas where it is difficult to justify the cost difference between a portable-size 9" black and white display and a larger sized color display.).

The 'instant solution' to this, for the North American marketplace (**if** the "SCDN" package is offered here), would be to treat each of the 'Slave Receiver' packages as a 'satellite receiving **converter**'. That is, the cable line plugs into the SCDN Slave Receiver and then the Slave Receiver produces a VHF TV output via a small add-on modulator, which can be received on a standard NTSC receiver. The viewer sets the standard receiver to the output channel of the Slave Receiver modulator and then tunes in the transponder desired on the Slave Receiver. **The basic advantage** of **full independent access** to all 20 (24) transponders, at each Slave Receiver location, **is still present** of course.



Use of slave receiver plus VHF Modulator (Video/ Audio baseband output is standard from "Slaves") allows viewing on standard color TV receiver.

2) It may be desirable, in some installations, to be able to selectively **eliminate** certain of the transponder services from the Satellite Cable Distribution Network. Some installations will not be authorized to distribute HBO, for example. The technique for doing this, at the 'Master SCDN Terminal', is worked out but because this particular "problem" is a North American problem, and does not exist in other portions of the world, implementation of this technique into real world hardware will have to wait until a hard decision to offer this package in North America is reached.

Through The Air

Now the original concept for the SCDN Terminal called for viewers to 'plug in' their Slave Receivers not via a piece of low cost coaxial distribution cable, but rather through small **rooftop home antennas**. To understand why this is desirable you have to mentally shift gears and move out of the neat block-row homes that dominate urban America.

While the costs involved here sound quite reasonable to extending up to 24 channels of satellite service to 100 homes per mile, not all of the world has 100 homes per (street) mile. Some have more of course; you could wire up a 200 room motel for less than you could wire up a mile getting through the concrete maize; but in so doing you might pass 1,000 homes or more.

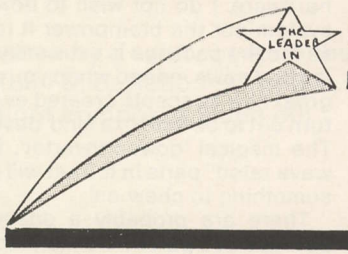
EARLY VERSION OF SCDN receiver we saw in May was engineering 'lab sample'. Those are transponder number across top of CRT. As you tune the tuning knob a 'tuning bar' slides across the screen (top of CRT to bottom) to tell you what channel you are tuned to; on screen display of tuning! Meter is for engineering purposes, not for 'home use'. Twelve volt operation is standard.

The SCDN Terminal concept was initially developed for areas that have **no** television. Areas such as one finds in Africa, many portions of South America, the Pacific and Asia. There the delivery technique would be through the air; not through cable.

Remember that the SCDN Master Terminal does some magic things to the **full set** of transponder signals, and brings them down to a high-VHF/ low-UHF portion of the spectrum. At this point the signals are still in their FM format (that may bother some readers). We can plan to carry those FM satellite signals around a neighborhood or building **via cable** in North America; but we could not transmit these same signals (as a block 500 MHz wide) through the air since we already have many other existing services utilizing the high-VHF/ low-UHF spectrum here. It **is** technically feasible that, in an isolated portion of North America, you **could** get away with transmitting the SCDN Master Terminal output over a small area and not run into interference (or create any); but the chances of getting the FCC (or DOT) license to do this are virtually nil. This is **not true** elsewhere in the world.

The people behind the SCDN project are well placed for dealing not with the individual sales firms but rather in dealing with national governments. Their customers, as it were, are entire nations and the people they deal with are the heads of state. At this level of discussion, they are able to arrange for the allocations of a whole 500 MHz chunk of spectrum to serve as the 're-transmission band' for the full output capability of a satellite.

Given this freedom to create a ground system that can support the 'air system', a very neat re-transmission package has been developed. Go back to the SCDN Master Terminal now and where the high IF output signal connects to a cable distribution system for distribution via cable, substitute a low power broadband FM amplifier which amplifies the entire 500 MHz band. Now we have a sufficient power level (in the neighborhood of one watt per FM (main) carrier for a 20 carrier 'spectrum') to feed into a transmitting antenna array. If



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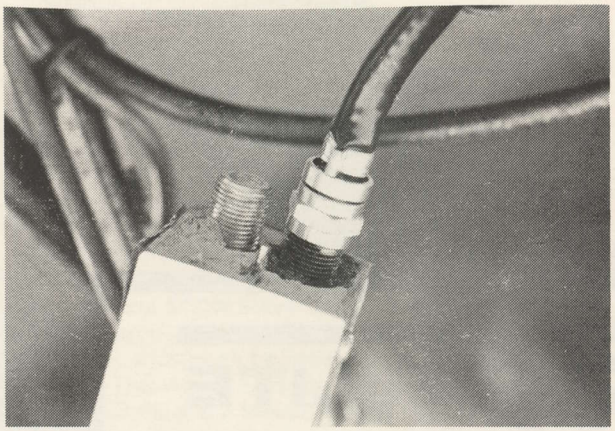


TWIN OUTPUTS- on this proto-type unit allow you to feed one set of full channels to SCDN and second set to a through-the-air power amplifier.

the transmitting antenna is elevated sufficiently above ground and normal good engineering practice is followed, you can then install a low cost (simple) receiving antenna at each location where reception is desired. And then each location will have its own 'Slave Receiver' connected to 'its own antenna. Coverage of 8 to 10 miles is realistic if you have 'line of sight' between the transmitting antenna and the receiving antenna. And by using transmitting antenna '**arrays**', the coverage area can be circular (all around the SCDN Master Terminal), a single direction or any combination of the two. It works just like the cabled package **except there is no cable**!

As you might suspect, if you can eliminate the $5000-$7000 per mile for cable/amplifiers et al and have a reasonable audience to serve, the costs per home can come down quite dramatically.

Security Will Be Tight

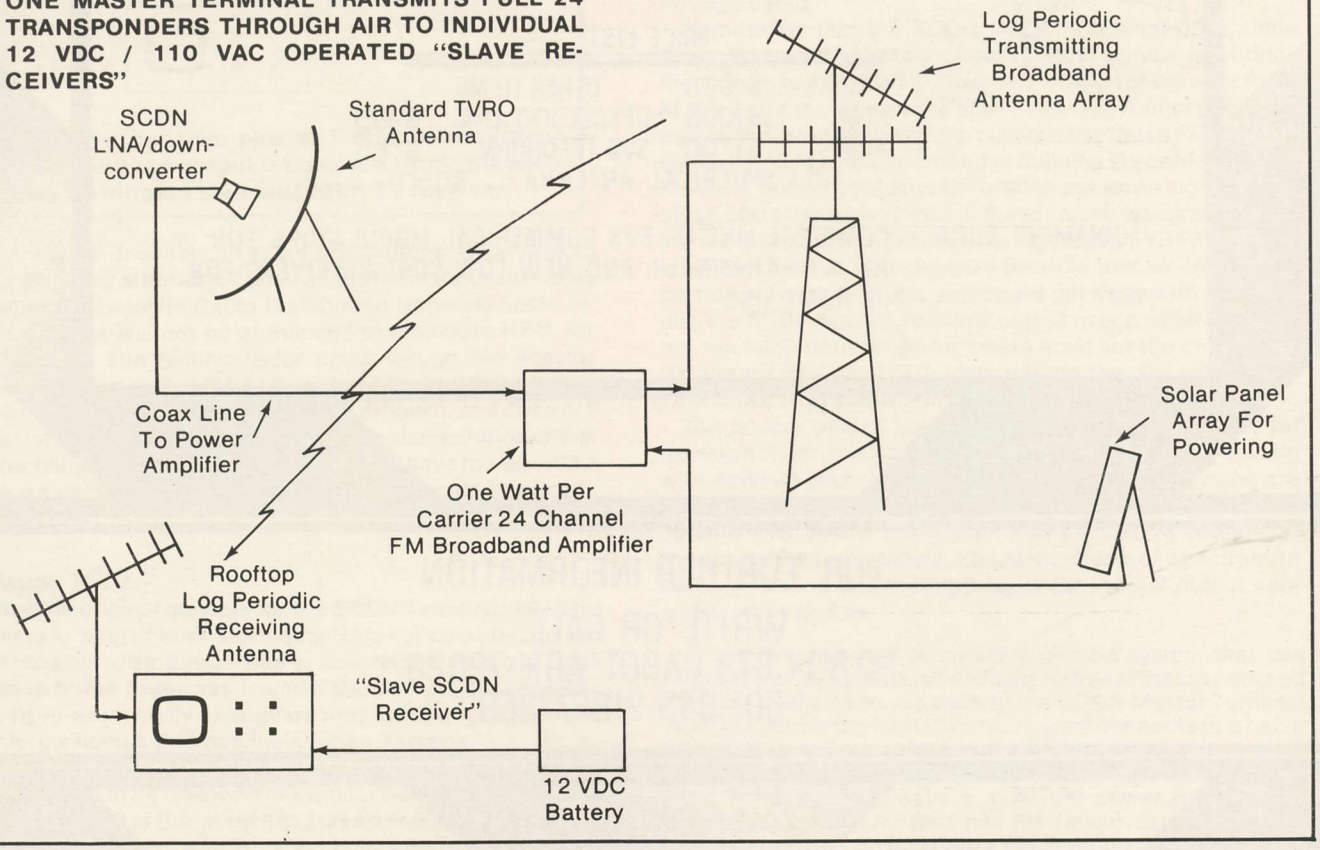
When I was first introduced to this technology back in May I was absolutely amazed with what I saw. Since that time I have had the opportunity to meet with the single individual who is responsible for creating the concept and the proto-type hardware, and with other individuals who are now taking that hardware and turning it into complete terminal packages.

I was particularly impressed with the utter simplicity of the hardware. I do not wish to downplay the complexity of the system nor the brainpower it took to make it work. But in a sense the package is extremely simple to **produce**, and that is good news indeed when you consider that there are lots of great new concepts created every day, but all too often they turn out to be 'one of a kind' devices which defy reproduction. The magical 'downconverter', for example, has **no** "microwave rated" parts in it. That will give our engineering readers something to chew on!

There are probably a dozen international patents and perhaps 100 patent 'claims' in this system. In this day and age if you get **one** patent with **ten** claims you have really done something outstanding. So as you might suspect, the 'security' surrounding public display of this equipment is going to be awesome in Omaha.

The equipment will be on display in a special booth area; actually four booths all in a row, to accomodate the crowd. It will be all by itself and there will be no other equipment on display other than the 'SCDN Package'. The equipment will be brought to Omaha in locked containers by special security personnel. The antenna for the system looks like any other

ONE MASTER TERMINAL TRANSMITS FULL 24 TRANSPONDERS THROUGH AIR TO INDIVIDUAL 12 VDC / 110 VAC OPERATED "SLAVE RECEIVERS"



GET THE BEST

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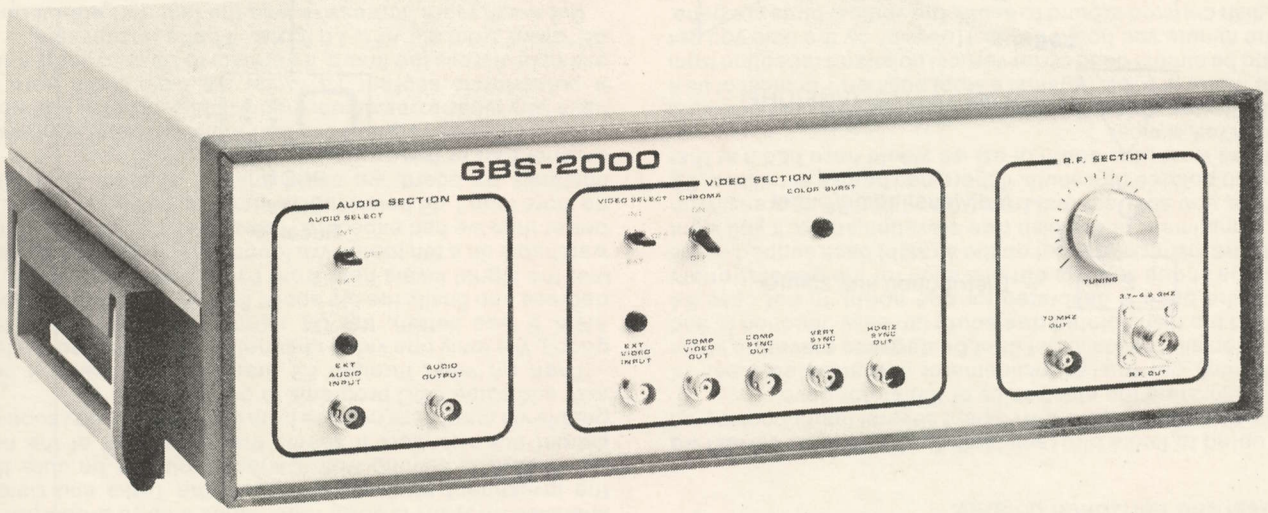
GBS 2000

Test Set

Designed by Taylor Howard, the GBS 2000 generates NTSC composite video at full FM deviation. The RF is tunable from 3.7 to 4.2 GHz, or you can have straight composite video out.



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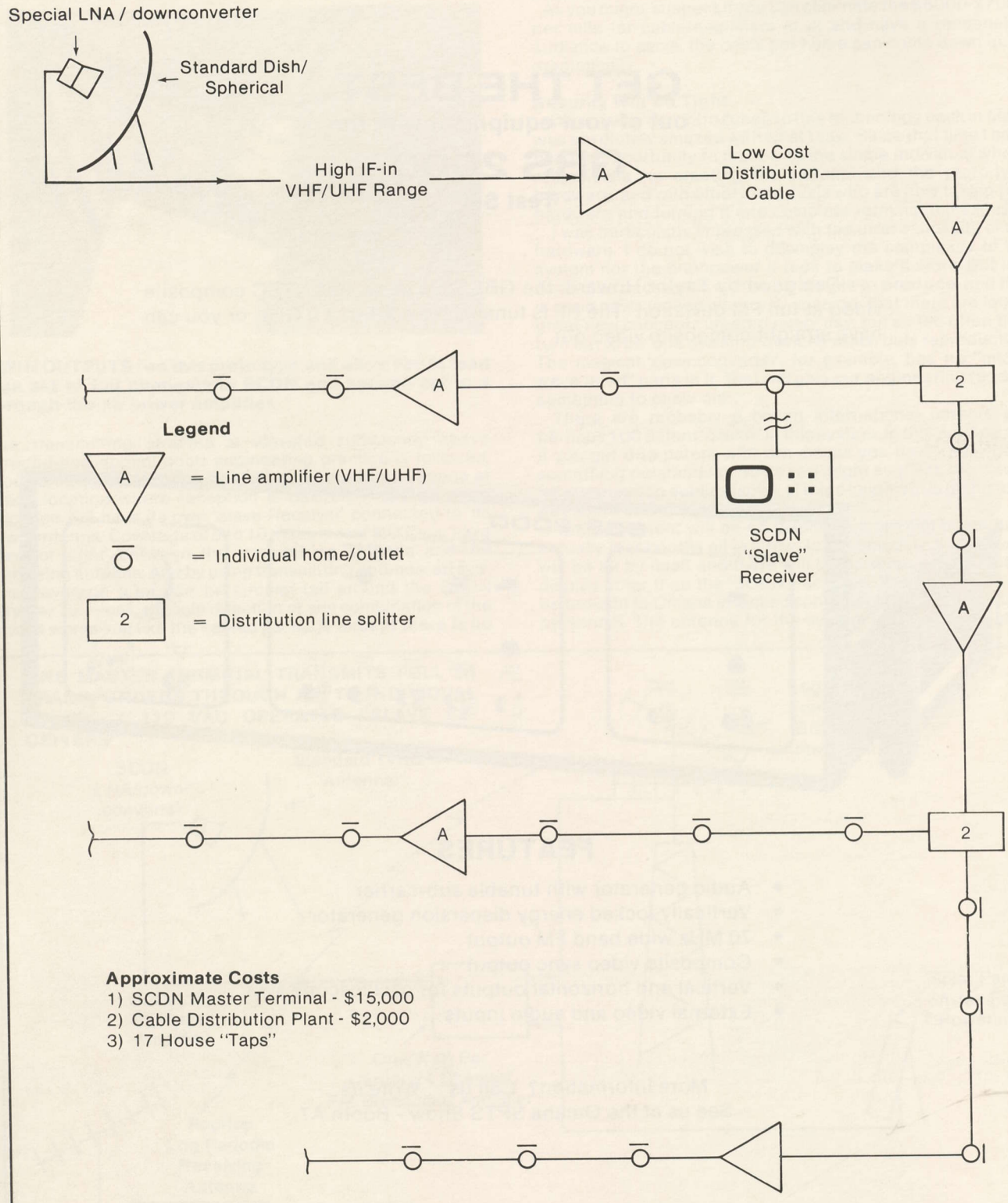


Approximate Costs

1) SCDN Master Terminal - $15,000
2) Cable Distribution Plant - $2,000
3) 17 House "Taps"

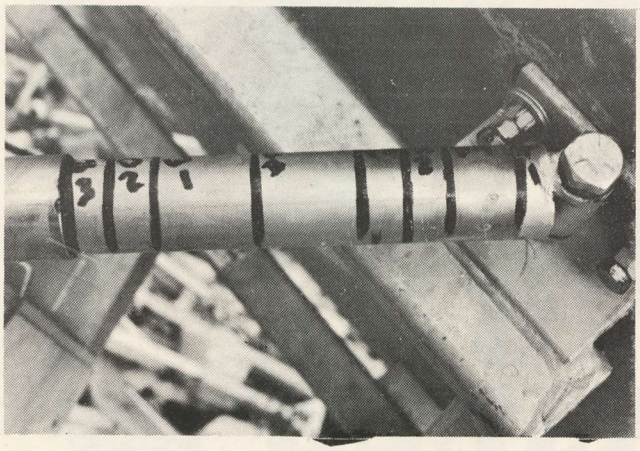
Seventeen Homes - One SCDN Master Terminal; Each house has independent access to all 24 transponders on bird.

SATFINDER user control box displays bird number (display is upper right), dish position (meter upper left), indicates dish motion and has two position switch for vertical and horizontal polarity.

We opted to find a bird (any bird!) **first**, just to be certain we had a usable dish before we spent several hours hooking up and calibrating the electronics of the motor drive.

We took our trusted inclinometer and adjusted a pair of elevation all threads to get us at **64 degrees elevation** when we had the dish pointed **due south** (an easy direction to find since the base is calibrated for due north). In our case 64 degrees at due south is **our** elevation for the **geostationary belt**. The inclinometer set on the straight back support reads the compliment of the dish true elevation angle; if you want 64 true, you subtract that from 90 and find 26 degrees. With the dish pointed due south, if there had been a satellite at 72 degrees west (due south of us) we would have had it at that point. Well, almost.

SatFinder ships the system with the vertical-horizontal drive motor in a rest (against a stop) position. For most of us it would be almost dead on for vertical polarized reception from FI the minute you hooked it up. However, by the time you get the dish cranked around to south, the vertical birds are gone. If we were going to check it out on the stronger (in our part of the Caribbean) WESTAR birds we would need to get the LNA motor into a horizontal position. It turns out the motor runs on 12 volts .DC. Connect up positive to green and negative to white and the motor turns; until it hits a stop (stops are built in for both ends of the rotation and they can be field set with allen set screws so your 90 degree twist vertical / horizontal window will suit your own coordinates). However, to get 12 volts out of the SatFinder control box on the appropriate pair of lines you have to connect up **all** of the electronics. Remember, we were in a hurry.



EIGHT BIRDS are visible on our test SatFinder here in the Turks and Caicos (each mark on the Saginaw Screw arm indicates a bird).

So we dragged out a car battery and shot 12 volts to the motor. In a few minutes time we had the LNA probe in the appropriate horizontal position and we began to crank on the hand crank to get us back to the west. In a few seconds time we found COMSTAR D3, loaded with voice and other narrow band traffic. At least we knew the terminal was working. Then a few more turns of the crank and there was WESTAR III. So far so good; we'd gone from 72 west (over the equator) to 91 degrees west and we were still tracking. And so the dish went on around. We ticked off COMSTAR D2, then WESTAR I at 99 degrees and then the expected gap of the Canadians. But there was a surprise here; Canada's ANIK-B, with five transponders of video, was of watchable (if not high) quality. We stopped to do some carrier to noise ratio checks and decided that with a 5.5 to 6 meter dish we would be totally out of the sparklies on ANIK-B down here. Since a large proportion of the investment money coming into the Turks and Caicos these days is coming from Canada, you can be sure this caught our attention. It seems that about half of the new people we meet here now are from Canada. One day soon we may add some CBC programs to our schedule.

Then on west through F2 (transponders 8 and 9 very good!), W2 (only one video channel up and it was **not** so hot; ANIK B was better), the D4 narrow band carriers at 127 degrees and finally the big apple; FI. Now the logic suggests that the signal levels here from F1 will be far too low to be watchable on a ten footer. We found them to be considerably better than we had expected. Transponder 7, for example, is no more than 1 dB below full quieting (i.e. no noise). Of the 20 channels on board, we could enjoy 4 of them and watch another four or five.

As an RF 'receiving unit' the SatFinder 10 footer appears to have very close to maximum theoretical gain in the real world. It outperforms another 13 footer we have down here for example. Across the board, it appears to be between 2 and 3 dB 'down' from our AFC 16 footer. **That's impressive.**

But much more impressive was the fact that after a quick set on due south by cranking the elevation all threads to the geostationary belt, using a $10 Sears inclinometer, we found **every bird** in the sky (but the A2/A3 combo which may not have been active at the time of initial tests), by simply hand cranking through the belt. The hand crank of course comes off and you slide the motor in when you want fully automatic operation.

The electronics. The SatFinder control utilizes a sensor that mounts to the antenna. It "transmits" the antenna position inside to the digital electronics. On the front of the control box you have a keyboard entry panel and after initial set up if you want a particular bird you simply hit two keys; in our case 11 is D3 and 01 is F1 for example. After a built in few second wait (during which you can correct an entry error) the keyboard hand entered command sends the dish moving through the sky to the selected bird.

The set-up procedure (which I am told is to be detailed for dealers with a new videotape) requires a combination of mechanical and electrical skills. And a reasonable understanding of geostationary navigation. I cannot recommend the installation of a SatFinder terminal to a "novice". There is ample opportunity for you, if you do something foolish, to sink the tubular base into a block of concrete in the wrong position; to mis-connect the quantity of control and power wiring, or, to get frustrated with the satellite programming sequence and mess up the control box. The simple fact is that while the SatFidner is extremely simple to use (i.e. **the user can be totally ignorant of technology**), and to our exper-

THE MERRIMAC "WIDE" RECEIVER, FOR ALL-STAR RECEPTION.

Merrimac introduces the SR-1 Satellite Receiver.

Offering the ultimate in performance and reliability, the SR-1 can help you "catch" every 4 GHz satellite channel with maximum efficiency..."interference free".

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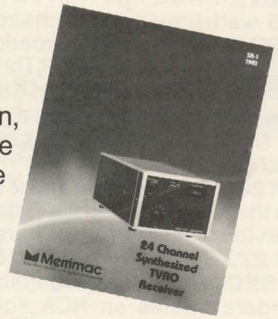
Available as a TV top model as well as a rack mount for CATV Systems; the SR-1 offers channel selection right in the palm of your customer's hands, or yours for that matter.

We can also supply you with microwave isolators, down converters, oscillators and splitters.

If you're looking for "professional fidelity" TV reception at "home viewer" prices, look into the Merrimac SR-1 Satellite Receiver. You'll like what you see.

For more information, call or write for our free brochure.



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Good data. Brass may be harder to find, and be more expensive...but you only need to buy one piece if you do it right.

NEVIS TVRO?

I want to set up a satellite antenna and receiver at my house down on the island of Nevis in the Caribbean. This is longitude 63 degrees 35 minutes west and latitude 17 degrees 12 minutes north. What size dish, what type of LNA, what type of receiver will I need?

John H. Gullett
Gullett and Hines
1301 12th Street NW
Washington, DC 20036

Last month we would have suggested you sit tight. However, a recent trip to St. Maarten by Bob Behar in mid-June with a 12 foot Luly portable antenna opened up the prospect **that at least** some **FI transponders (7, 11, 20 and 23 and F2 transponders 8 and 9) would be quite enjoyable on either a 5 or 6 meter dish. Your look angle on FI will be below 10 degrees and into the high teens on F2. With F3R, you'll get back to about ten degrees again.**

REBROADCAST IN PUERTO RICO

I wish to install a satellite TVRO so I can pick up FI transponders 6,17,18,21 and 3. I would like to know if I can utilize a low power translator for each of these channels and transmit them on VHF channels 8,9,10,11,12 and 13. Do I really need all of these separate translators or could you show me something else that might do the job? What will I need to send to the FCC to obtain a license for all of this?

Gilbert Santiago
Penuelas Communications
Box 508
Penuelas, Puerto Rico

Last question first. You'll need an address in Anguilla or some other non-US territory! Under present FCC rules, what you propose has several serious (legal) **problems; but not technical problems that can't be solved. Start off with a copy of the STT** Low Power TV Handbook.

BIRD OPERATIONAL NOTES

EVIDENCE that RCA may be planning to bestow the four 8.5 watt transponder channels on F3R to HBO mounting. HBO swapped Trinity Broadcasting (KTBN) out of their transponder 13 on COMSTAR D2 (see **CSD** for July), to gain use of same TR 13 on F3R when it activates late this year. Now HBO says they will move present HBO west coast feed from TR 22 to TR 13 when F3R comes on line. That suggests F3R line-up for HBO **may** look like this: TR **13** HBO **west**, TR **24** HBO **east**; TR **23** Cinemax **west**, TR **22** Cinemax **east**. That leaves TR 20 as the likely channel for Time, Inc. and their new data channel service for cable subscribers. Based upon mechanics of F3R, 13,22,23 and 24 **could be** 8.5 transponders **if** RCA agreed.

SECOND rumor regarding who will get 8.5 watt transpnders quotes an RCA source as allocating the top four transponders (21, 22, 23, 24) to 8.5 watt use. In this scenario HBO still owns three of the four and fourth (TR 21) is up for sale after failure of Premiere program.

COURT battle and loss of Premiere program attempt is putting squeeze on HTN (Home Theater Network). HTN started as 2-3 hour per night service on TR 21 several years ago, sub-letting from then owner of 21, SPN. This spring HTN was allowed to expand to 6 hours per night pending resolution of Premiere legal battles. On July 1 HTN was cut back to original 3 hour period by Premiere, who wants to sell the transponder as cleanly as possible. HTN is now 80% owned by Westinghouse and it could use one of 10 Big-W channels on WESTAR's 4 and 5 **when** they are active. In interim, HTN is looking for home and and could end up on WESTAR 3 on short notice.

EXPERIMENTAL Indian Apple satellite, with C band capacity on board, was successfully launched by ESA Ariane L103 in mid-June. Bird check out should be complete by 1 September. Ariane's successful launch after earlier failure puts European Space Agency squarely in running for launch facility business. A fourth test launch will go in October, and the first commercially available launch is scheduled for February of '82.

LOOK for major changes in make-up of TR 3 subcarriers this month. WGN common carrier, United Video, adding trio of new services with WFMT and Seeburg services already in place. New services include 24 hour country and western service, 24 hour pop music (MOR format) service and 24 hour "Beautiful Music" service from Bonneville Broadcasting.

ANOTHER new subcarrier, Moody Bible Institute Radio Network, due to begin operations on subcarrier on TR 6, 1 September. 24 hour service will feature bible teaching, dramatic series.

WTBS's Ted Turner charges Westinghouse and TelePrompter with conspiracy to 'kill' CNN. Turner claims Westinghouse has plans to launch own 24 hour news service, on one of 10 WESTAR 4/5 transponders it will use. Turner has filed at FCC to block Westinghouse take over of TelePrompter.

PRICING of 'professional grade receivers' in TVRO field dropped again. COMTECH has dropped price to $1870 per unit (in 10 lots), for model 550 receiver that tunes all 24 channels with selectable 6.2 and 6.8 audio. The gap between high quality home style receivers and professional grade receivers continues to narrow.

WITH Showtime going to 24 hour per day service (TRs 10 and 12) 4 July, American Educational Television Network use

NOTICE!! — Vidiark Electronics, pioneer of the famous "8-Ball" satellite antenna has developed and is now in production of an all new **high performance** satellite receiver. Also, from now on, will be operating under the name of **McCullough Satellite Systems, Inc.**

The 8-BALL

SATELLITE TELEVISION ANTENNA

HAS IT ALL

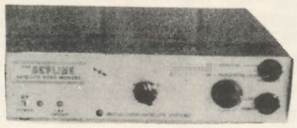
PRICE: Less than half the cost of other antennas.
PERFORMING: The "8-Ball" consistently out performs all other antennas of equal size.
DURABILITY: With its open mesh surface and wide stance frame. The "8-Ball" will survive winds fatal to other antennas.
APPEARANCE: Blends in pleasantly with the environment.

Size	1-3	4-Up	Heavy Mesh	Extra Bracing	Galvanized Frame
8-ft.	$495	$395	30	25	65
10-ft.	550	445	45	40	80
12-ft.	595	475	60	50	100

Avantek LNA (120° In Stock) $650.00
Microdyne Commercial Receivers.... $2600.00

The McCullough Receivers

Single Shot $1085



Skyline $1285

— FEATURES —

- Removable downconverter - can be left in receiver **or** placed at antenna
- Single conversion with image reject mixer
- 6.2 & 6.8 Audio - others on request
- Discriminator type video detector
- Polarity rotator switch
- LNA Power Jack (+18vdc)
- Modulator power jack (+12vdc) Additional features on skyline model
- Smooth action 10-turn tuning control with LED bar channel indicator
- Remote control included
- LNA circuit monitor

Crystal controlled modulators (type used in home video recorders) - Ch 3 & 4, wired to plug in rear of receiver - Cost $75.00.

— Feed Horns —
Galvanized $25
Aluminum $40

McCullough Satellite Systems, Inc.

P. O. Box 57 — Salem, Arkansas 72576
Phone: 501-895-3167
501-895-3318

of Showtime transponders in daytime came to a close. AETN meanwhile is looking for public funding, having lost more than $2.5M since start-up last fall. Fate of professional instructional service in some doubt.

SOUTHERN PACIFIC Communications, granted orbit spots at 70 and 119 degrees west by FCC last fall, **now says** it will offer 119 degree spot bird (due to launch February 1984) to **cable** industry. Calling bird SPACE NET 1, SPC asking $175,000 per month for standard C band transponder and claiming coverage to all 50 states. SPACE NET 2, at 70 degrees west, presently planned for narrow band data only, with September 1984 launch schedule.

STARTING August 15th on WESTAR 3, TR 12, a new Catholic operated service intended for cable distribution. The Eternal World Television Network will be operating four hours per night (7-11 PM eastern).

HI-NET, satellite operational arm of Holiday Inns, will have 350 motels equipped with satellite terminals by the end of this year. In first year of 'video conference' operation, 19 business conference sessions were transmitted. Because receive terminals are also receiving HBO service (for in-room distribution), HI-NET must use as-available transponder time on FI (F3R later this year), but admits it is looking at joint or single venture to acquire own transponder directly.

RUBARB growing over some aspects of SPACE operation likely to boil to a head in Omaha. Primary concerns are approaches to raising much needed funds, how funds are spent. Abrupt resignation of SPACE coordinator Gayle Barnes late in June placed outgoing Prexy Taylor Howard in middle between Barnes and Counsel Rick Brown. Barnes has circulated SPACE operational data to numerous industry leaders hoping, she says, to gain their support for SPACE office **separate from** Counsel's office.

VALUE of an F1 transponder may come into focus if ill-fated Premiere service is able to get full $15M asking price it wishes for TR 21 there. Price includes full uplink terminal in Connecticut as well. Rental fees to RCA come on top of "buying in" price.

DBS proponents arguing best way to handle new proposed services. STC says it will charge $100 for dish and $300 for electronics plus $14 to $18 for monthly (three channel) service. **DBS Corp.** meanwhile says its satellites will have ten channels each, total of 30 channels spread over 3 time zones. **ORROX Corp** says it plans to sell $500 home DBS terminals to Canada starting end of this year; sees Canadian market as large as 1.2 million terminals.

RCA PLAN to allow some users of Cablenet 1 (F3R) to receive second transponder on Cablenet 2 (F4) has been turned down by FCC. Commission ruled that with more firms interested in transponders than there are transponders available, any move by RCA to limit **variety** of users would not be in public interest.

SEPTEMBER 30, 1982 is date set for first commercial flight of Shuttle; subject to all additional test flights going off without major hitches. ANIK C-1, 12 GHz DBS bird, has spot on that flight.

USING ANIK B, a Canadian group will start experiments in June of 1982 of a Canadian Satellite Business Network. First test user will be Bank of Nova Scotia.

LATEST SOVIET launch in Molniya series was June 9th; another Molniya 3 bird in the inclined orbit path that includes North American TV coverage. **INDIAN APPLE** bird, launched by Ariane in mid June, failed to properly deploy both solar panels. Bird is operating, but at half of capacity.

MUD SLINGING between CNN and Westinghouse continues. Turner accuses Big W of trying to create an empire that will freeze out competition, using Big W's arrangement to lease ten Westar 4 and 5 transponders as an example of the muscle involved. Westinghouse says Turner is simply asking the FCC to insure CNN has no competition for several more years.

ABC HAS JOINED CBS in calling for all 12 GHz DBS systems to be used exclusively for "high definition" 1,100 line television. Both networks see 12 GHz birds as way to change present TV standards to picture clarity that can only come with large increase in number of scanning lines in video.

PBS may have ultimate answer to scrambling. They say plans are underway to convert all TV transmission to **digital format** so that video signals leave PBS control center as digital data and go back to analog format only at TV transmitter of local affiliates. Primary advantage to PBS is ability to squeeze **two** full video signals into **a single** transponder.

LITTLE known House bill (HR 1957) would establish new official US committee to shape US policy on international communication matters. If bill passes, impact on way US deals with matters such as non-US use of domestic satellites could be effected. Sponsor is Rep. Glenn English of Oklahoma.

LATEST round of LPTV filings continue to swing heavily towards 10 watt VHF transmitters. Channel 13 for Miami, 7 for Orlando are amongst those requested.

FIFTEEN hour per day mini-CNN service, designed to be operated by local newspapers, plans April 1982 start from New Hampshire headquarters on bird yet to be named. CNC (Cable Newspaper Corporation) is promoter.

VEU SERVICE, recently taken over by SelecTV, on Westar 3 TR 5, says it will be first to go to scrambled bird signals. They will test Oak's Orion scrambler system during September 16th Leonard/Holmes championship fight, and claim if test works they'll convert to fully scrambled mode "promptly".

NEW Hispanic language service now launching in southern California, with terrestrial hookups, plans to go nationwide 8 hours per day in 1982. Called **Buena Vista Cablevision**, service will transmit most of programs in English and when Spanish language programs are shown, subtitle them in English. Satellite for service not yet selected.

A 24 HOUR per day 'classic movie channel' now being promoted in cable arena; to be satellite delivered. Promoter is Video Communications of Tulsa.

HOME THEATER NETWORK (HTN), bumped out of six hour per night service on TR 21, F1, has purchased use of WESTAR 3, TR 7 for 8 PM to 2 AM (eastern) feed. HTN **continues to use** TR 21 on **F1** from 7 PM to 10 PM eastern on a temporary basis.

USA NETWORK, on TR 9 F1, will expand to 24 hour service this October 5th. C-SPAN will continue to use the same transponder during daytime hours until it finds an alternate transponder.

BARBADOS test with 12 foot Luly portable antenna by Bob Behar proved successful with acquisition of F1 and other signals. Behar also found extremely strong signals from French **Symphonie** bird during 12:30-1:15 PM (eastern) feed of live news from Paris; first apparent private terminal reception of French bird at 11 degrees west. Details in September **CSD**.

SEVERAL WESTAR 1 transponders ailing; TR 1, 6 and 11 reportedly now operating at ½ power or less. Westar 4, due for launch spring of 1982 is likely to be much needed by May when it is scheduled to replace W1.

EFFORTS to pin down cause of polarization shifts on F1 noticed at low look angle locations bearing fruit. Apparently shifts are tied to **local heavy rain** conditions and seem most apparent at look angles below 20 degrees. Additional study on-going at several private terminals in effected areas.

CSD will carry coverage of Omaha SPTS in forthcoming September issue. **READERS** moving must forward their mailing envelope label to **CSD** two weeks or more in advance of moving showing both old address (with label attached) **and** new address **plus** effective date of move.

SATELLITE OPERATIONS MANUAL by Bob Cooper reveals innermost secrets of satellite operations, who uses them, how and where. ALSO extensive coverage of simple tricks to improve reception, troubleshoot terminals, maintain high performance, locate special services.

NELSON PARABOLIC MANUAL by Nelson Ethier describes theory behind and step by step construction of 10 and 12 foot fiber/metal sandwich high performance TVRO antennas. Literally a manual to start an antenna business in your garage! Includes complete mount, feed instructions.

GIBSON SATELLITE NAVIGATOR - superb treatment of antenna mounts, tracking systems, full understanding of how complex world of geostationary orbit belt can be reduced to simple layman terms. No satellite buff should venture through the skies without it!

____ **YES** - Enter my order for **Coop's Satellite Operations Manual** via first class mail. $30 ($35 outside US, Canada, Mexico) enclosed.
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SATELLITE BUSINESS MANUAL by Coop provides full business game plan for selling, installing private satellite terminals as a business venture. Includes comprehensive look at most of the equipment now on the market, discusses dealer/supplier relationships.

"NEW" HOWARD TERMINAL MANUAL - As modern as the 1981 satellite industry; this newly revised edition covers the construction of the Howard Terminal receiver following the highly popular circuit boards available. Thousands have been built; this one tells how to do it!

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AUGUST 14-15-16 IN OMAHA, NB.

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_____**SIGN ME UP for SUMMER '81 SPTS IN OMAHA** - My registration fee of $150 is enclosed. Return to me confirmation of my registration and motel registration information.

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to explain just what TVRO service is, on a one-on-one (in home) basis or for public displays such as service clubs. Also on same tape, approximately 50 minutes 'Coop Talks To Dealers'; a frank discussion of equipment quality and marketing approaches.

____**SEND** 'Satellite TV Story' on ____VHS ____BETA (**specify** which); $60 enclosed in US funds.

____**SEND** 'Satellite TV Story' on ____VHS ____BETA (**specify** which) **with custom video 'tag' identifying our business as follows (name, address, telco):** _____ _____/$70 enclosed.

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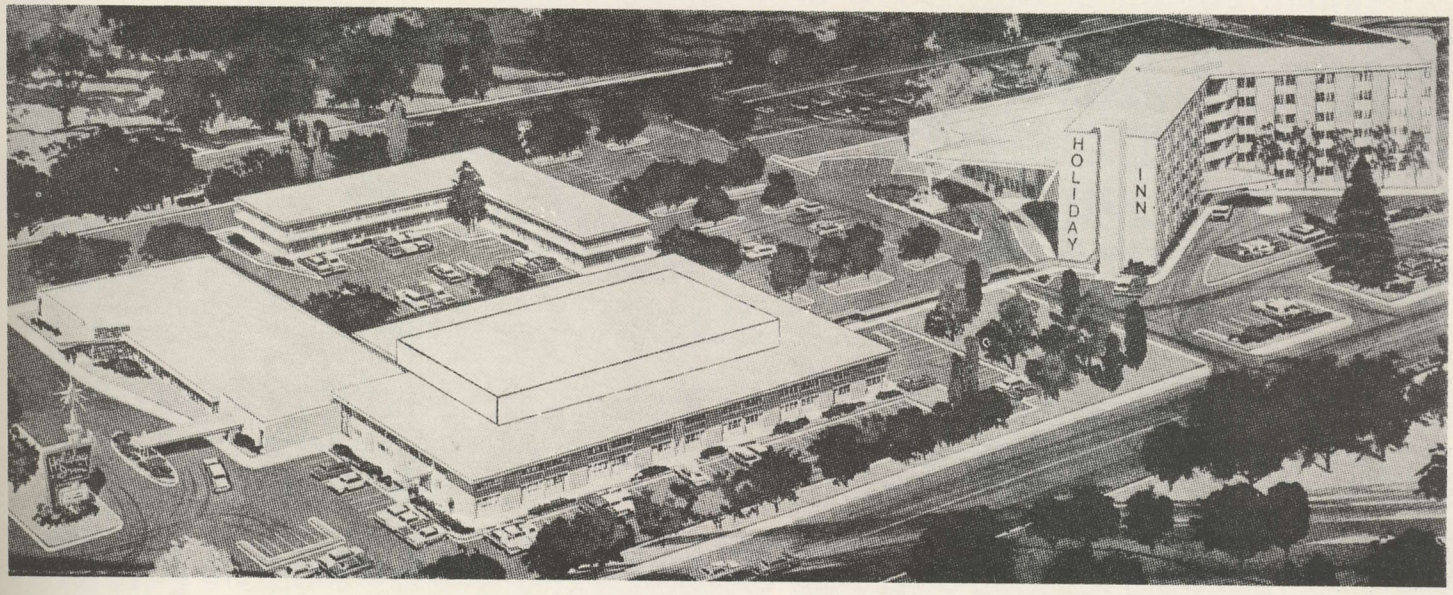

"Back to Basics". Three days like no SPTS ever was. You start off with intensive, professionally taught seminars that acquaint you with antennas, LNAs and receivers. Then you are turned loose to select from several dozen "small group" Learning Centers where you talk directly, one-on-one, with leading experts in these fields. You get all of the basics first and then you go on from there to find out how to get top performance out of every part of the low-cost, home satellite system!

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OR CALL for full details; SPTS '81 at 405/396-2574.

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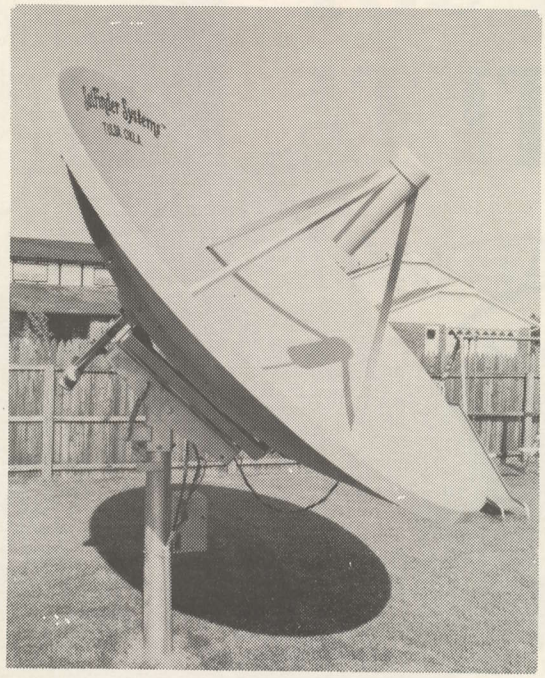
- **EASILY** shipped in spite of its impressive size. The entire package is so carefully designed and well thought out that it ships and goes together with the precision of a fine instrument.
- **SMOOTH** operation. Touch the motor drive switch and watch the transponders zip by; from F1 on the west all the way to the INTELSAT and GHORIZONT signals in the far eastern sky in just sixty seconds time!
- **HERO COMMUNICATIONS is now accepting applications for new dealers.** We offer the world's finest six meter antenna system (5 meters also) direct from the manufacturer. Our experience in solving tough installation problems will save you money and time in completing your own installations. We offer sound technical backup based upon years of experience in this field.
- **PLUS** - from HERO COMMUNICATIONS you deal with a warehousing distributor for WASHBURN, AVCOM, and ICM receivers, a complete line of accessories including ½ inch hardline, connectors, modulators AND the fantastic 85 and 100 degree DEXCEL LNAs. We manufacture and handle nothing but the field-proven-best equipment in the industry today. Whether you need a single connector or a complete system, HERO COMMUNICATIONS is here to serve you.

HERO COMMUNICATIONS
1783 W. 32nd Place
Hialeah, FL 33012
(305) 887-3203

EXCELLENCE IN PERFORMANCE THROUGH PRECISION ENGINEERING

NOW. . .A SatFinder Antenna System For Less Than $3,000.00

SatFinder. . .the people who pioneered the first quality rotatable receiving satellite system. . .the system that rotates through all satellites, not just 20 channels. . .the system that eliminated gear and switch adjustment and the use of bulky motors and heavy wires. . .

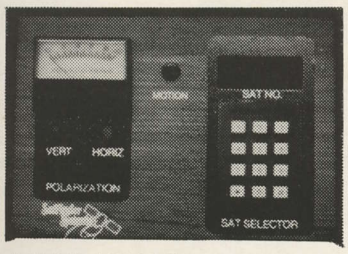


SS-3 HAND ROTATABLE ANTENNA PACKAGE NOW ONLY $2895.00 WITH SATFINDER ELECTRONIC ROTATION PACKAGE $3995.00

COMPARE OUR 10′ DISH TO ANY 13′ DISH

SATFINDER. . .THE SYSTEM THAT PUT THE STARS AT YOUR FINGERTIPS WITH JUST THE TOUCH OF A BUTTON BRINGS YOU AN ANTENNA SYSTEM FOR UNDER $3,000.00

Our new 23,000 square feet manufacturing facility enables us to give you the SatFinder quality you have seen and read about at this incredible new price. Now you too can afford the system that has been called "the Cadillac of the industry".



SatFinder command control allows you to instantly select any satellite you choose with just a touch and is easily programmed for future satellites.

MONEY BACK GUARANTEE
You must be completely satisfied with the performance and ease of installation or your money back.

AVAILABLE IN:
3 Meter 5 Piece
3 Meter Solid
Custom Colors (Standard color—Sandy Beige)

SatFinder Systems

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AVCOM QUALITY YOU CAN DEPEND ON

Satellite Receivers

Choose AVCOM for Outstanding Performance and Reliability!

Remote Control Capability

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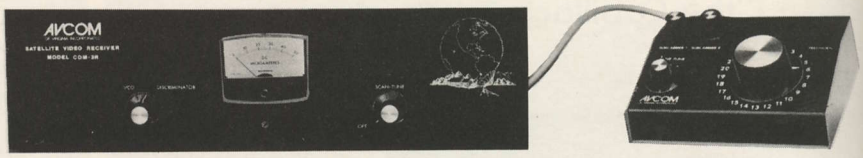
The COM-3

Scan-Tune
Up to Six Audio Subcarriers
Versatile Front Panel Controls
Handsome, Hand-etched, Anodized Front Panel
LNA Power via Coax or Rear Panel Connector

AVCOM

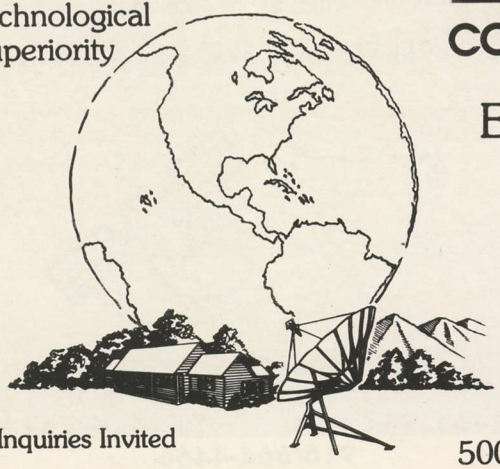
- Conservative Design
- Exceptional Reliability
- Quality Construction
- Technological Superiority



COM-3R complete with **REMOTE CONTROL UNIT**

Everything you need for your complete Satellite Earth Station

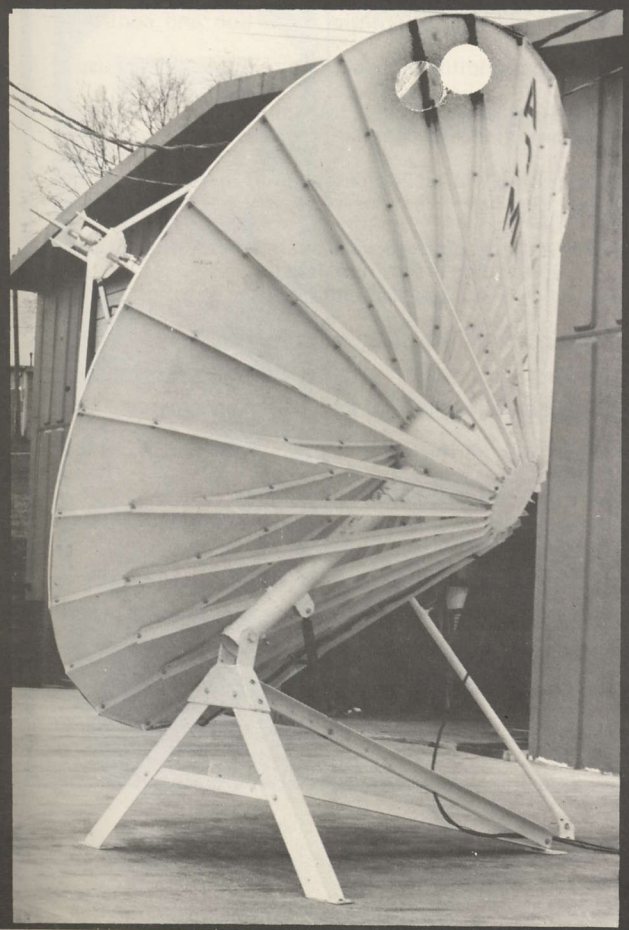
See your **AVCOM** dealer or contact us.



Dealer Inquiries Invited

AVCOM
OF VIRGINIA INCORPORATED

500 Research Road • Richmond, VA 23235 • 804/794-2500



ANYWAY YOU LOOK AT IT...

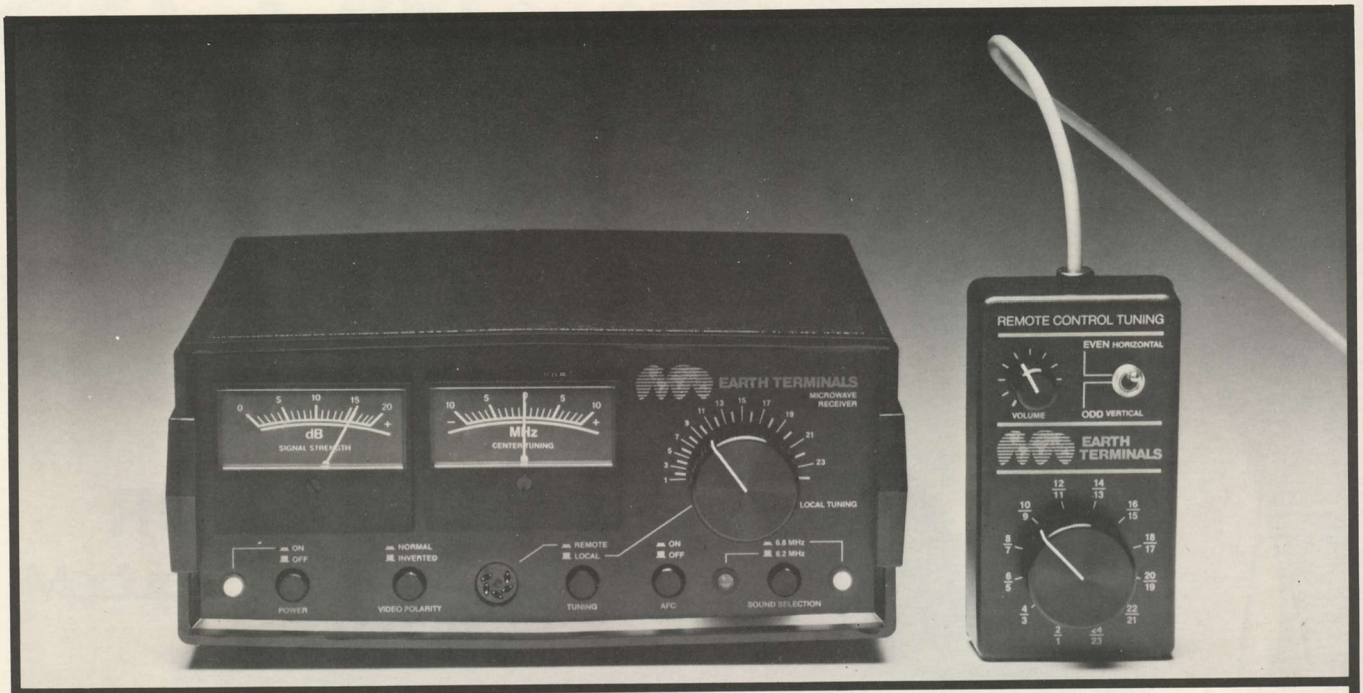
ADM HAS YOUR ANTENNA!

AND YOUR TVRO SYSTEM. Rapid delivery on ADM's super-efficient 11 foot polar mount antenna (includes remote controlled polarization rotation system as well!), plus, packages are available for complete systems including LNA, 24 channel tuneable receiver and cabling. Why wait in a long line when you can get the best, today!

A SUPER TVRO ANTENNA SYSTEM. High quality panelized aluminum 11 foot dish and steel polar mount. Dish weighs approximately 200 pounds, mount 265 pounds. Precision designed, easy installation, zinc chromate base primed and heavy duty white top finish. The rotating feed is standard! Easily shipped and installed. Choice openings for dealers and distributors.

Antenna Development & Manufacturing, Inc.

P.O. Box 1178
Poplar Bluff, Mo. 63901
(1-314-785-5988)



THE WASHBURN™ TVRO RECEIVER

EXCEPTIONAL PERFORMANCE

- **TRUE EXTENDED THRESHOLD** - 7 dB under full video modulation conditions, achieved through meticulous attention to removing limitations imposed by components.
- **HIGH FIDELITY VIDEO** - Full 30 MHz I.F. bandwidth and 8.4 MHz video bandwidth prior to final subcarrier filtering, coupled with heavy negative feedback in all high level video stages for very low differential distortion and controlled transient response.
- **HIGH PERFORMANCE AFC** - Eliminates the need for fine tuning and provides additional dispersion rejection for full use of the I.F. filter bandwidth and superb interlace.
- **FULL REMOTE CONTROL** - 25 ft. (extendable) remote allows an untrained user to easily select transponders and control the volume of the High Fidelity Audio Output. Normal transponder selection automatically commands correct feed polarization through a closed-loop servo.
- **SELECTABLE SUBCARRIER PRIORITY** - With visible subcarrier indicators and two easily changed plug-in detectors (5.5 to 8.4 MHz available, U.S. or CCIR format). Usually eliminates the need to manually select subcarriers, while allowing manual control when desired.
- **FULL FUNCTION METERING** - With selectable manual tuning and AFC disable allows checks of system CNR without additional equipment. Continuous monitoring of Signal Strength (in linear dB) and tuning error (in MHz).
- **VCR COMPATIBLE** - Video and audio levels allow use of your VCR as a modulator, providing immediate recording without cable changes when desired.
- **DESIGNED FOR RELIABILITY** - Careful cost / performance balance to insure continued quality reception.

SUPERIOR VALUE

- **LOWEST IN-PLACE SYSTEM COST** - ''Bargain'' receivers stop being a bargain when you add up the antenna and LNA costs for sparklie-free reception with higher thresholds.
- **USER ACCEPTANCE** - Compact, pleasant packaging, easy operation, and high performance with small antennas suit it to homes and neighborhoods where ''experimenter's'' equipment would be unacceptable.
- **VERSATILE** - Easily reconfigured for shared use of a single ortho antenna by multiple receivers and homes.
- **SIMPLIFIED INSTALLATION** - Separate Demodulator Console, Downconverter, and Rotor Control Assemblies eliminate routing (costly) hardline through finished rooms and allow easy relocation of the control point.

EARTH TERMINALS

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Cincinnati, Ohio, 45246
513 - 772 - 6900

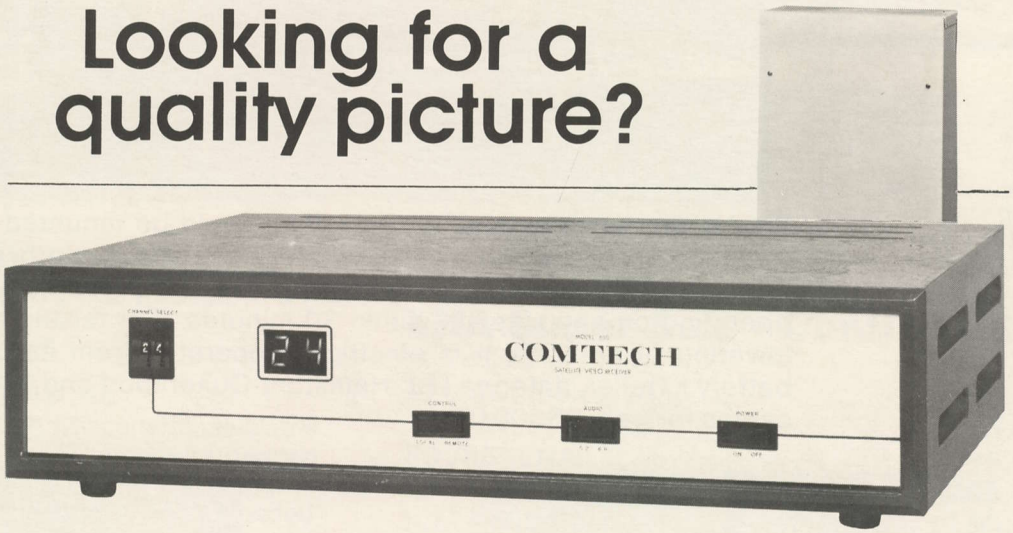
COMTECH

COMTECH
Data Corporation

Wonder what channel you're on?

Tired of constant re-tuning?

Looking for a quality picture?



Model 650 Satellite Video Receiver

The Model 650 control unit is housed in a wood console with the down converter antenna mounted for the most economical installation. The unit has a 24 channel LED display, 6.2/6.8 MHz program demods, DC block, automatic polarization switching and remote control capability.

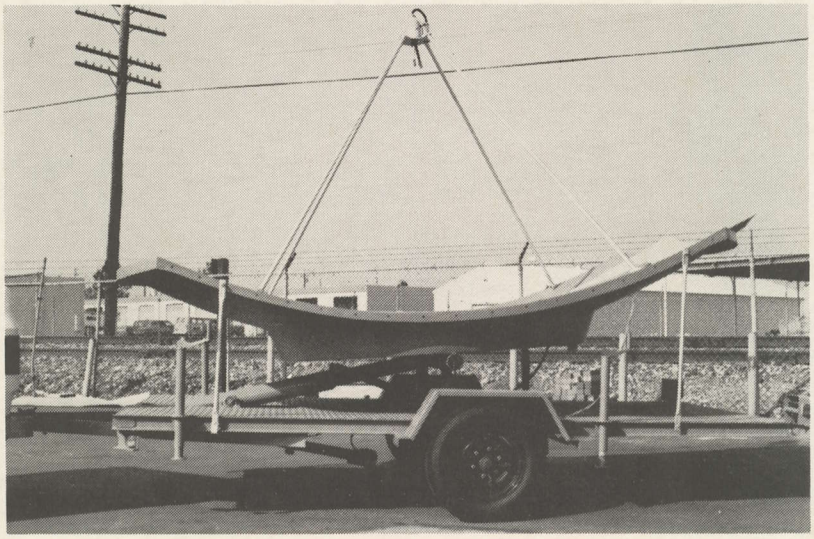
The Model 650 provides reliability and the highest quality picture available with a full one year warranty. Comtech has more than a decade of experience, and we'll be here in the future to serve you. **Immediate delivery available.**

COMTECH Data Corporation A SUBSIDIARY OF COMTECH TELECOMMUNICATIONS CORP.

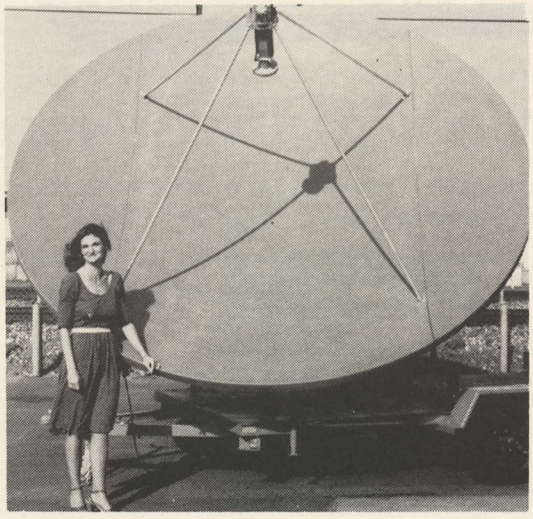
613 S. Rockford Dr. / Tempe, Ariz. 85281 / Phone 602 968-2433 / TWX 910-950-0085

HAMILTON SATELLITE SYSTEMS, INC.

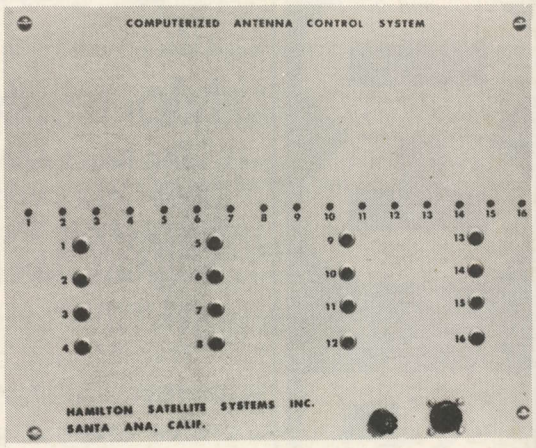
1101 E. Chestnut Street Suite A
Santa Ana, California 92701
(714) 543-5217



This is the way we think an antenna should be mounted for trailering. It can be towed at highway speeds with no worry of a blowover. You can park it in any position, and you can be operating on any satellite within 30 minutes. (For raising and lowering of antenna, it is electrically operated from its own battery.) Trailer, antenna (12' Hamilton) Quadrapod and 50' of cables for only $3500.00.



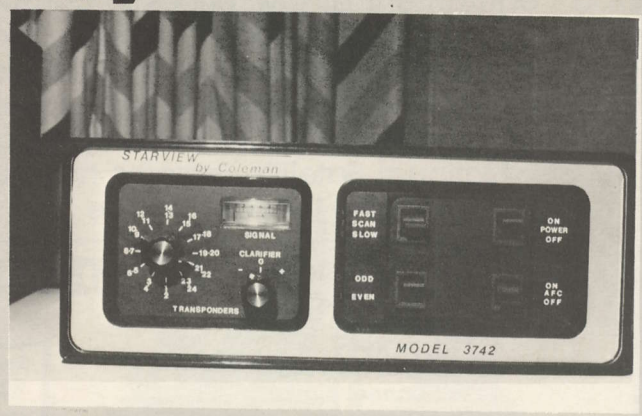
Hamilton 3.66 Meter (12' Diameter) Satellite Antenna. Three piece, solid fiberglass, aluminum flame sprayed with a durable gel coat finish. Focal Depth .4, Gain 41.2 dB at 4,000 MHz.
Weight 360 lbs. Crated.
So. Cal. Dealer for:
Avcom, Comtech Data, Teknimat, Dexcel and Chaparral.
Stock on hand.
Immediate Shipment.



The ultimate AZ-EL Microprocessor, Computerized Antenna System. All solid state, no mechanical relays. Power failure will not affect programming. It can be remoted a thousand feet with a small cable, for hand held control. Field proven throughout the U.S. and Mexico. Can also be used on polar mounts.

SPECIAL: 12' Antenna, AZ-EL Mount, Quadrapod with Rotator and LNA Holder, Antenna Computer with Actuators and hardware complete $4500.00. Uncrated F.O.B. Santa Ana, California.

Starview Systems Has Manufactures Direct Pricing For The Industry



Introduces the MODEL 12K SYSTEM...

A complete home satellite receiving system that you can assemble yourself as a week-end project.

Why spend $7,000 to $10,000? Why pay someone else to install it! Do it yourself in a week-end and save.

50 Channels

KIT CONTAINS

- 12' Antenna
- AZ/EL Mount
- 24-channel tuneable receiver
- 120° LNA
- Feed Horn
- All Miscellaneous Cable and Connectors needed
- Everything You Need
- No Special Tools Needed

DEALER COST $2400.00

U.P.S. Shipable anywhere in USA.

Price $1595.00

NEW!!! Coleman 3742 Receiver!

Scan-tuned, multiple audio sub-carriers, local or remote control, superior threshold performance, full metering, double conversion of course. And available exclusively from Starview Systems.In stock for immediate delivery.

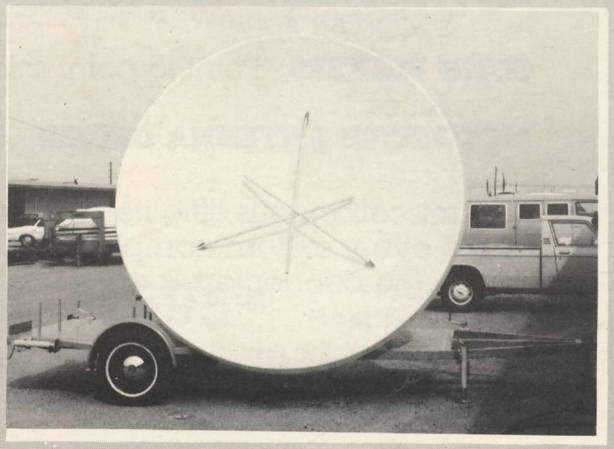
LNA Super Sale - Continues!

120° Avantek LNA	575.00
100° Avantek LNA	975.00
80°/85° LNA.	1595.00
ICM 4000 Receivers	995.00
ICM 4400 Receiver.	1150.00

New Low Pricing

STARVIEW DEALER SPECIAL

Get in on the ground floor as a TVRO dealer in your area! Starview Systems provides you with everything you need; professional instruction plus the finest mobile sales terminal on the road today. Included is a 10 foot Starview parabolic equipped with rotating feedhorn, Avantek 120 degree K LNA, top of the line Starview 24 channel tuneable receiver, 75' of coaxial and connection cables plus a trailer to get you to the demo site and operational in 30 minutes time. And the price? An unbelieveably low **$4800.00**



STARVIEW SYSTEMS

H & R Communications
Route 3, Box 103G
Pocahontas, Ark. 72466

501/647-2001 • 501/647-2291
1-800-643-0102

ATTENTION DEALERS:

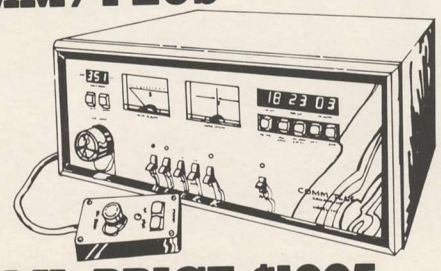
National Satellite Systems is one of the fastest growing distributors of TVRO Systems. Since 1978 we have placed no minimums on orders, no pressure sales, no conflicting dealer territories, we simply offer you excellent TVRO equipment at low prices to compete in the TVRO market. In most cases, delivery is from stock. Our staff at National Satellite Systems has over 82 total years of microwave experience. Also, we can be reached on the weekends for your convenience. We are constantly researching new products for our dealers. Make your dealer application today, it's easy!

National Satellite Systems has over $60,000 of test & alignment equipment for after-the-sale service.

FEATURES:

1. Dual Conversion
2. Bult-in video descrambler!
3. LNA power supplied (24 VDC)
4. 24 Channel digital switch with fine tune
5. 6.2-6.8 audio switch
6. AFC control for no drift operation
7. Signal strength and carrier null meters

COMM / PLUS



RETAIL PRICE $1995

8. Dual polarity driver board optional
9. Attractive wood cabinet
10. Down converter at the antenna is optional.
11. Remote control for tuner (20' of cable)
12. Low prices for our dealers

NATIONAL SATELLITE SYSTEMS is proud to be the stocking distributor for the following lines of equipment:

ANTENNAS - 2', 4', 6', 8', 10', 12', 13', 15', and 20' diameters.
ADM - KLM - Mid America - Miralite - Prodelin - Vidiark - Wilson

RECEIVERS - 4 and 12 Ghz
Automation techniques - Comm-plus -Comtech - Vitalink - KLM
National Satellite Systems - Microdyne - Scientific Atlanta

LNA's - 4 and 12 Ghz
Amplica - Avantek - MA/Canada

RF MODULATORS - Sony - Uhf Associates - National Satellite Systems

LPTV TRANSMITTERS - Television Technology (complete systems from $2400.00!)

GUNN PLEXERS - Point to point microwave systems over distances of 20 miles.

MOTORIZED ANTENNA DRIVER - Quantum - National Satellite Systems

Plus, miscellaneous little items in stock that are absolutely necessary to make every system complete, including ferrite isolators, coaxial switches, relays, "N" connectors & adapters, dual feed systems, scaler feed horns, etc.

Used equipment also available for greater savings.

NATIONAL SATELLITE SYSTEMS

Division of

SOUTHWESTERN SATELLITE SYSTEMS
2501 Candelaria N.E.
Albuquerque, NM 87107
Phone (505) 883-3626 Monday thru Saturday

Call Toll Free
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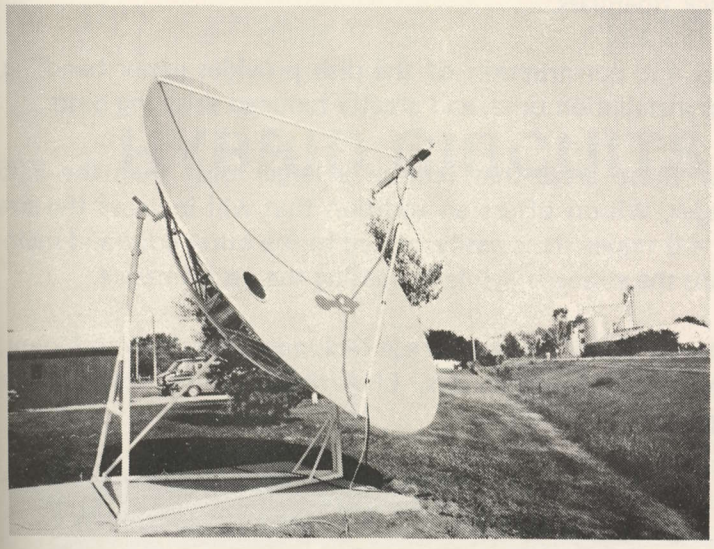
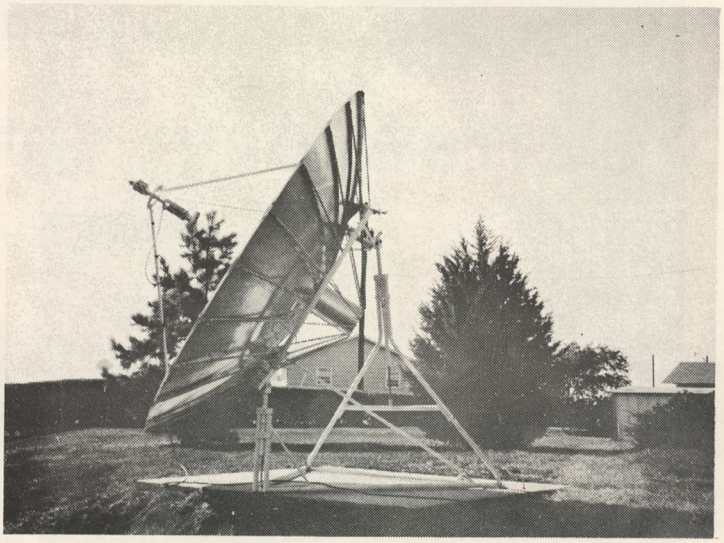
800-545-6416

IT'S ABOUT TIME!

One of America's Oldest and Largest Metal Fabricators is Manufacturing A Commercial Grade Parabolic Antenna At a Reasonable Price.





[SPECIFICATIONS]

Diameter - 12 Ft./(3.6 Meter)
Construction - Aluminum (24 Section)
Gage - .060 and 3/4 Hard
Gain - 41 DB Nominal
F/D - .375
Wind Survival - 100 MPH
Antenna Weight / Mount - 425 Lbs.

[ANTENNA-INCLUDES]

- Steel Polar-Mount
- Rotor and LNA Mount
- Rotor
- Feed Horn (Scaler)
- White Finish

DEALER

SINGLE LOT – $1395.00 F.O.B. Hastings, Nebr.

(Call For Quantity Pricing)

SEE YOU IN OMAHA

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HASTINGS ANTENNA CO.-INC.

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(402) 463-3598

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HASTINGS, NEBR.
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Wilson Microwave Systems
Satellite Antennas

Wilson Microwave Systems uses the latest state of the art method of manufacturing the parabolic designed antenna. Resistance to distortation and instability is increased with the addition of a full screen mesh sealed within the ¼" thick fiberglass.

The 4pc construction of the dish provides easier handling, less installation time, and greatly reduced shipping costs.

For those areas that require a larger dish than the 3.35 meter, Wilson offers an addition that will increase the size to 4.0 meter. It is easily bolted to the outer edge and maintains the strength, while increasing the performance.

The Wilson antenna package includes antenna, Vari-Mount, manual satellite locators, LNA/rotor mount, rotor, and a rectangular feed horn.

Wilsons unique "Vari-Mount" provides the easiest installation and mounting method available today. Simply dig 4 holes with either a post-hole digger or an auger, 4 feet deep. Form a base with 2 x 4's for a finished look, then insert the four furnished bolts. Fill with 12 - 14 bags of Redi-Mix and it is finished.

With the exclusive 4 point Williams' mount, you are assured a quicker installation and that the antenna will be more securely fastened to the Vari-Mount. The antenna struts aid in stabilizing the fiberglass for operational reception in winds of up to 50 - 60 MPH.

A ball bearing race allows easy turning of the antenna in changing to the different satellites. A scale is included on the base to assist in their location.

The Vari-Mount comes standard with manual satellite locaters in the form of gear driven hand cranks. Easily turned, they offer the most economically accurate method of rapidly moving to a different satellite.

DISTRIBUTOR & DEALERSHIPS AVAILABLE

WILSON MICROWAVE SYSTEMS,INC.

4286 South Polaris Avenue - Las Vegas, Nevada 89103

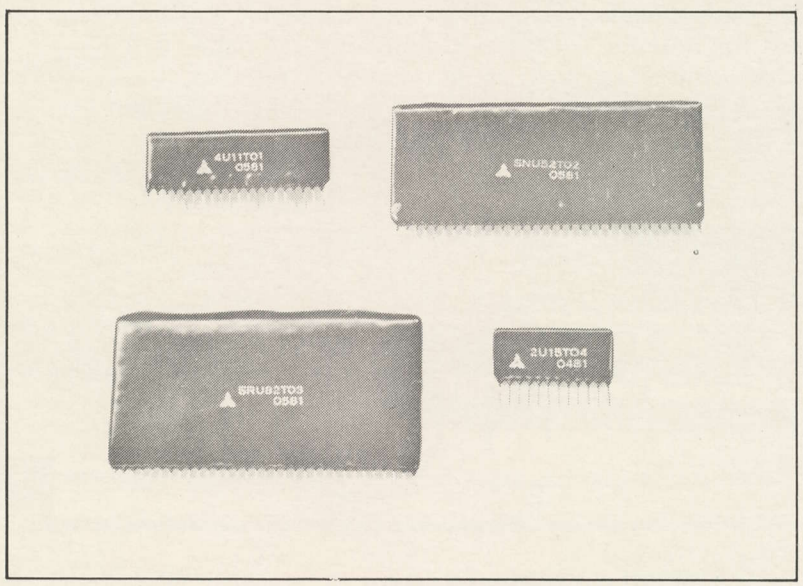
A NAME KNOWN TO THE COMMUNICATIONS INDUSTRY FOR OVER 12 YEARS

FOR INFORMATION Call (800) 634-6898 or (702) 739-7401

MICROELECTRONICS TECHNOLOGY CO.

INTRODUCES ...

HYBRID CIRCUITS FOR TVRO SYSTEMS



Now available in production quantities:

- **TO1** Wideband FM Demodulator.
- **TO2** Video Processor.
- **TO3** Audio Processor.
- **TO4** De-emphasis/Video Filter

Two additions to the line will be introduced at SPTS '81 OMAHA. Visit our booth B11 for a close-up look at this new technology.

Microelectronics Technology Co.

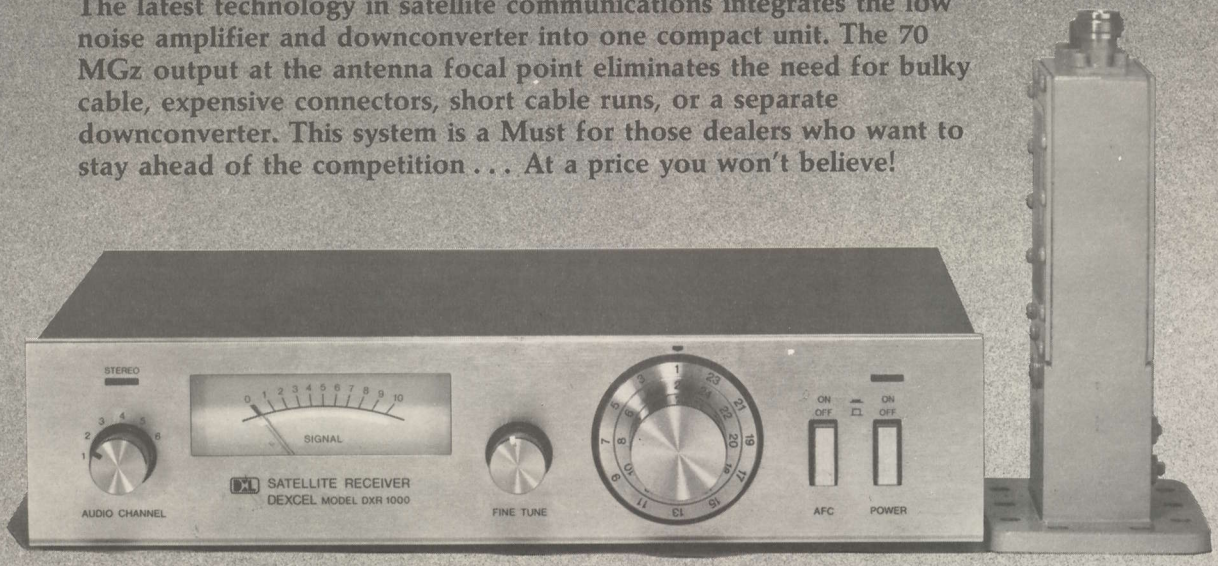
2446 Watson Ct. • Palo Alto, CA 94303 • (415) 856-0300

NOW AVAILABLE FROM ECHOSPHERE CORPORATION

THE MOST ADVANCED HOME TVRO SYSTEM. . .

ALSO THE MOST AFFORDABLE!

The latest technology in satellite communications integrates the low noise amplifier and downconverter into one compact unit. The 70 MGz output at the antenna focal point eliminates the need for bulky cable, expensive connectors, short cable runs, or a separate downconverter. This system is a Must for those dealers who want to stay ahead of the competition . . . At a price you won't believe!



DEXCEL DXR 1000 Satellite Receiver

Low Noise Amplifier/Downconverter

SYSTEM FEATURES

- 120 K or 100 K integrated low noise amplifier and downcoverter
- Built in modulator and power supply
- Attractive styling with brushed aluminum finish
- Stereo output with six audio subcarriers
- AFC and fine tune control for optimum and stable video
- Signal strength meter to aid in antenna adjustment and fine tuning
- 24 channel select and inverted video switch
- Remote control option
- 11 ft. parabolic, fiberglass antenna
- 4 piece antenna design for low shipping costs and easy installation

ECHOSPHERE CORP.

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(303) 797-3231

Distributors of Complete Satellite Systems and Components

STAR TRAK SYSTEMS, INC. EXPANDS!

RLS8530D Receiver	$1695
SL200B Commercial RX	1745
LNAs	495
Dealer Demo Package	4995
Complete Systems	4240
Motor Drive	295

Need Parts? We probably have 'em . . .

Modulators — 3-4 switchable
IN STOCK $79.95

VTO — WJ907
IN STOCK 120.00

WHY PAY MORE???

We manufacture our own receivers, LNAs, dishes, stands & motor drive assembly. Buy at factory prices. Quantity pricing on some items.

CALL TODAY FOR DELIVERY

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Introducing commercial quality Satellite Television for your home.

Now Satellite Technology Services offers you the commercial expertise to engineer the precise satellite television system for your home.

STS stocks a complete line of top quality components at competitive prices with full warranties.

And STS insures you fast delivery with its "ready ship" inventory program.

For more information and our free brochure, call our toll free number.

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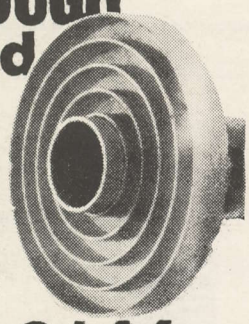
Satellite Technology Services, Inc.
11684 Lilburn
St. Louis, Missouri 63141

Dealerships may be available in your area.

BREAKTHROUGH Apollo Feed



These new high performance feeds are ready for immediate delivery From National Microtech. Inc.

1 unit	$59
5 units	$49
10 units	$42
100 units	$35

1-800-647-6144

LNA Breakthrough

Off shelf delivery on Amplica LNAs—wholesale dealer prices

120°—$595 105°—$795
110°— 695 100°— 895

(All feature through the line power, full data sheets.)

Amplica's breakthrough on lightning retardation enables us to offer a full year warranty—even if lightning makes a direct hit. Quantity discounts on Amplica LNAs to National Microtech distributors available.

Call Dave Fedric and join the Microtech team as a dealer or distributor **TODAY!** Call toll free:**1-800-647-6144.**

National Microtech

THE RETRO FIT KIT

MOTORIZED ANTENNA ACTUATOR

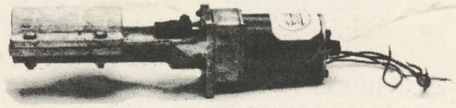
THE FINGERTIP CONVENIENCE OF

50-60 CHANNELS

INSTEAD OF 20

- Fits all existing 2¼" screw jacks.
- Simple installation (1 person approx. ½ hr.)
- 115V AC operation (no batteries)
- Simple instructions included for 2-switch control installation.

No more hand-cranking and no costly structural installation



ONLY $236.00

Includes motor, couplings, aluminum mounting brackets and instructions.

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P.O. BOX 15730, New Orleans, LA 70175 (504) 891-7210

AVAILABLE SOON:
THE AFFORDABLE DIGITAL LOCATER
DEALER INQUIRIES WELCOME.

SPACEAGE ELECTRONICS

COOP'S SATELLITE DIGEST P1-8/81

COOP'S COMMENT ON PROGRAMMING

SPACE AT THE CROSSROADS

There was considerable jubilation during the April SPTS '81 event in Washington when SPACE Counsel Richard L. Brown informed members of the Board of Directors that tentative agreement had been reached with both Home Theater Network (HTN) and SHOWTIME allowing for the reception of the two program sources by non-cable / MDS terminals. The initial agreement appeared to be that commercial terminals, such as motels, hotels, apartment buildings, condos and the like would now be able to contract for HTN, or Showtime service, just like cable TV and MDS operations. Held out was the implied suggestion that private, home terminals would follow; shortly.

SPACE issued a memorandum to that effect telling member dealers that they could offer legal HTN and Showtime service to their customers. Dozen of terminal sales for commercial establishments hung on that permission and a major obstacle which has plagued the private terminal industry since its inception seemed to be evaporating.

SPACE's Brown was able to pull this off because he had gone to the FCC to block the announced purchase of TelePrompter (which owns 50% of Showtime), by Westinghouse. The FCC never **ruled on** the SPACE legal papers; Brown was able to get HTN (which was also bought by Westinghouse recently) and Showtime legal counsel to agree to the private terminal use of their programming, '**out of court**'.

During May a handful of private terminals **did get** contracts with HTN. Nobody got one with Showtime. And then the roof fell in. HTN stopped processing contracts and Showtime acted like it had never agreed to do it in the first place.

When contracts stopped at HTN, Brown filed a vigorous statement on behalf of SPACE, at the FCC, charging HTN with "**deliberately attempting to deceive the FCC**" by previously stating that individual home terminals **could purchase** program rights with HTN. HTN responded by telling the Commission "**SPACE has blown the issue totally out of proportion**", and then went on to explain to the Commission that HTN had agreed to serve home viewers and did in fact do so until two of its major (movie) program suppliers objected. Columbia Pictures and Warner Brothers, according to HTN, were objecting to HTN serving home viewers, and claiming that HTN could **not sell** its program package to **private terminals** without violating the contracts HTN has with Columbia and Warner.

Now both Columbia and Warner have extensive financial interests in cable television. Warner is one of the big-three cable operators, and it operates The Movie Channel, Nickelodeon and the new pop music channel that began service this August 1st on TR 11. That cable TV interests view private home terminals with some alarm is hardly news.

All of which places SPACE back almost to square one on the all important programming rights issue. The HTN / Showtime 'victories' were the first for SPACE. **If** they had 'stuck', the precedent they set would have perhaps opened the door for more realistic private terminal / master antenna agreements with the other program suppliers, who to date have refused to allow **authorized viewing** of their services.

It now **appears** HTN and Showtime gave in on this issue on paper only; that they had no intention of honoring the SPACE agreement any longer than it took them to get by the temporary obstacles SPACE created for Westinghouse at the FCC. HTN says it is not its fault it has to stop processing contracts; it simply cannot afford to 'breach' contracts with Columbia and Warner.

This is of course hogwash. HTN **knew** what those contracts said **before** it agreed to the SPACE plan. Columbia and Warner **knew** HTN and Showtime were involved in this legal squabble, and they had adequate opportunity to raise their objections to HTN and Showtime **prior to** the two reaching paper-accord with SPACE. It appears to us that somebody engineered this scenario just to get Westinghouse off the hook at the FCC. Now Westinghouse can say "**We tried...but Columbia and Warner shut us down**"; and shrug their shoulders and walk the other way.

There **is** of course a master plot here to deny rural Americans access to satellite television. There **is** a sub-plot to deny use of satellite signals to master antenna systems not operated by members of the favored cable television industry. The whole thing stinks from start to the finish.

This places SPACE at a new 'crossroads'. The organization is about to have a new Board of Directors; possibly a new President. It is facing an uphill financial battle for support from our industry. And now it is facing a legal posture that has slipped from poor to terrible in just a matter of weeks. Omaha may well turn out to be the most important gathering for SPACE in the history of the industry.

CSD PROGRAMMING

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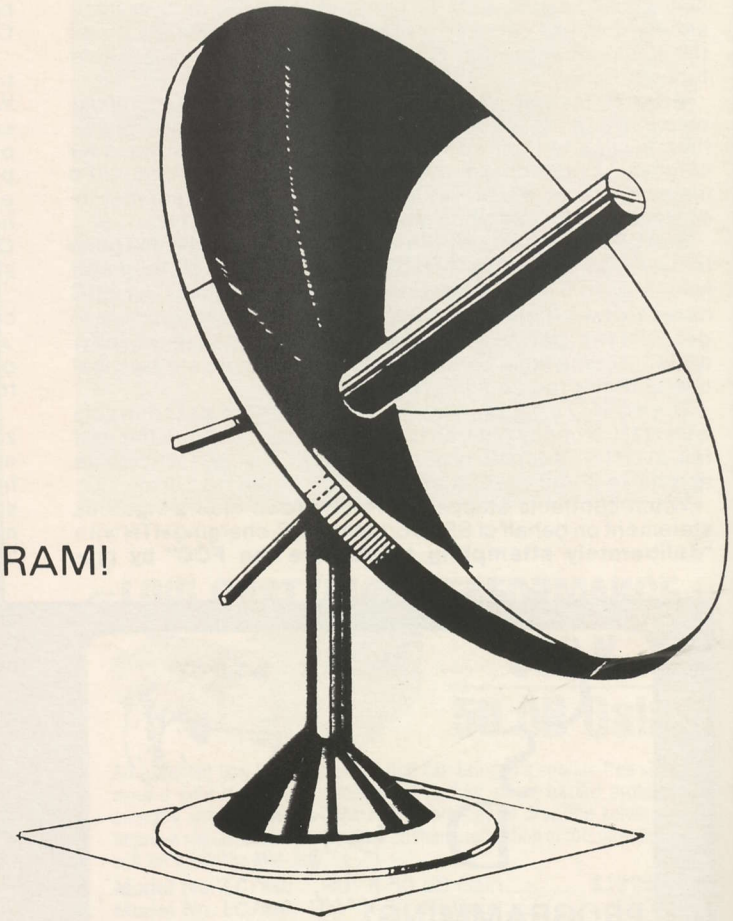

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PRODUCT REVIEW SatFinder TVRO AUTOMATED DISH

BY STORM

If ever a terminal package has caught the imagination of sellers of terminals, the SatFinder ten foot (3.0 meter) motorized dish antenna would appear to be that system. David MacZura, the creator of the package, became interested in the home satellite terminal business along about the Miami SPTS. He attended, shopped as a would be dealer, and came back home to Tulsa, Oklahoma with an antenna and receiver

SATFINDER dish has neat appearing profile and with some careful planning all control, powering and RF cabling could be brought from the dish to the receiver location inside of PVC pipe to keep installation neat and proper.

line. MacZura already operated a television service center and he had a long list of successful business hits behind him in spite of his youth.

MacZura had been extremely successful serving a top dollar clientele in the Tulsa area. He reasoned that people with money do not mind spending big dollars for the fetish of the moment as long as they perceive the value in what they buy. And that reasoning had served him well with other ventures he nurtured from seeds to healthy businesses. He immediately saw in the home TVRO field the latest wave in 'money is no object' attraction for his customers.

Between the Miami and San Jose SPTS events MacZura got a rush course in how **not** to do things in the TVRO field. His first experience with dishes was bad; the quality of the dish surfaces and the mounting was not up to the standards he felt his monied customers would demand. He also didn't want to spend his life repairing broken parts and after an early dish arrived and he leaned against it and found the only thing in one area of the surface was a skeleton thin layer of fiberglass covered with white paint, he decided that enough was enough; he would design his own dish and go into production.

But it was the mount which perplexed him the most. MacZura, at a time when almost everyone was happy with the 20 or so transponders on FI, thought he saw the handwriting on the wall. "**I reasoned that the RCA lead in transponder rentals would not last; that we would look back on this some years from now and see this RCA dominance as a slight abberation in the development of satellites. This whole industry was going to explode and before we got done there would be television carrying birds from one horizon to the other in 3 or 4 degree steps**". The SatFinder 20 position control box came out of that thought process. MacZura pretty much had it worked out by the time he got to San Jose but thought better of bringing it onto the market at that time. "**I saw all of the new equipment being rushed into the marketplace, often** before **the bugs were out, and I decided that there were two ways to do this. I could announce it, take orders and hope we got all of the major bugs found before volume production started,** or, **I could continue to sell them as part of my** own **terminal package where we could respond locally to problems quickly. I decided on the latter approach, confident that if we could go for a month or two months without any failures on our own then we would be ready to share the terminal electronics with others**".

By the Houston SBOC event MacZura was, he felt, ready for the test of the marketplace. Dozens of his own terminals, utilizing a high accuracy five piece fiberglass ten foot dish of his own design and manufacture, and the electronics that was becoming known as SatFinder, were in and running. The failure rate had been reduced to near zero and the time was right for a marketing program. The Houston show was less than satisfactory for MacZura. The equipment worked well enough alright but it may not have had the right climate for introduction. Of all of the SPTS/SBOC shows to date, Houston will be remembered perhaps as the 'Novice Show'. Hundreds of new, would-be dealers showed up. Most had absolutely no background in electronics, not to speak of satellite communications. It was a frustrating event for the new exhibitors who didn't have a proven track record to fall back on, and, any technology that was not readily grasped by the Novice attendees was quickly discarded in favor of 'simple explanations' and 'simple equipment'. It was a price conscious show and the SatFinder was not cheap.

Between the Houston and Washington SPTS this past spring SatFinder grew up. Not discouraged by Houston, David went back to work refining the last few things that bothered him about the mount and mechanics of his package, and carefully selecting a few 'qualified' dealers to sell his product. Anyone who cares to investigate the way SatFinder sells terminals in the Oklahoma/Kansas region will quickly discover two things:

1)SatFinder does not cut any corners on an installation. From the strength rating on galvanized bolts to the way antennas are individually wooden-crated for shipment, the whole operation has class.
2)SatFinder is not ashamed to ask a healthy price for their installed packages because MacZura insists that the terminal work 100% of capacity 100% of the time. When a fault occurs, even if it is in Colorado in the middle of a blizzard, MacZura has somebody on the first available airplane to correct the problem.

SatFinder has attempted to align itself with dealers who share the same philosophies. Having dealers is getting SatFinder into some most unusual places. For example, there is the Long Island installation recently completed where a SatFinder ten foot dish sits on a manmade island in the middle of a rich person's $2,000,000 manmade lake. The island is some 800 feet from the shoreline, and while the lake was being built and before the island was to be 'landscaped', SatFinder sent in a crew to bury in the bottom of the 'lake' (before the water was let in) some 800 feet of special over sized control and RF cables to get the SatFinder interconnected to the multiple receivers that are to be part of the package. Or there is the SatFinder in a suburb of Philadelphia which sits on top of a three story peaked roof; it took a crane to put it there and thousands of dollars in reinforcing on the century old roof to work this one out.

But still, in spite of having what many judge to be a quality product, backed up by a staff and crew that takes a back seat to no competitor in the industry, the whole concept (for the moment) is built around what must be considered a small dish; ten feet in aperature to be exact. Just how good can a small dish like this perform in an out of the way spot such as the Turks and Caicos Islands?

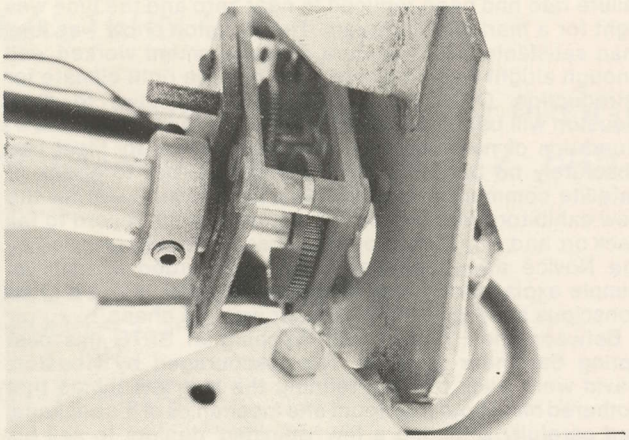
Getting the antenna system down here proved to be far less traumatic than we envisioned. We've had far more problems with packages considerably smaller and less complex. The antenna proper ships in two crates; one for the center back section and another for the four perimeter panels. Inside of the larger crate containing the four panels are packed some of the smaller pieces for the mount. The mount itself comes in a couple of more bundles. Heavy steel, galvanized completely, rides well even in multiple airplane transfers. The electronics (SatFinder control box, powering equipment) comes in a heavy cardboard container. The only shipping problem we experienced (the last leg in the hold of a DC-6 cargo freighter) was the wooden crate for the center antenna piece. Some place alone the line some cargo handler decided, apparently, he needed to build his kid a playhouse and he ripped off (literally and in the jargon of the day) the full crate. We gulped when we saw the 'nude' center section tumble out of the DC-6 hold, certain the rough handling had done something tragic to the fiberglass. It had not, indicating to us that the panels are high quality stuff.

One of the handy things SatFinder supplies is a full set of real, honest-to-gosh blueprints. We handed the blueprints and the boxes of hardware to a local chap who had never even seen a satellite antenna before. Then we pointed to the pile of panels on the ground and the galvanized metal. "Dig a hole 4 feet by 4 feet and throw in a bunch of extra steel" said we to him. "Yell when you are ready to set the big tubular base piece into place so we can align it on due north". And then we went back to running a television station. Actually, for most terrain, the amount of concrete we put into our hole would be overkill. However, we have two things against us down here. First, the SatFinder is installed on a sand dune. Our helper found coral rock down about 30 inches or so but the top part is simply sand. Well packed I admit, but not your typical Georgia Clay. Second, the wind blows down here. Every now and again we get a hurricane through the Turks and Caicos and I don't want to have to go west to Cuba to pick up parts of my various antennas after it passes.

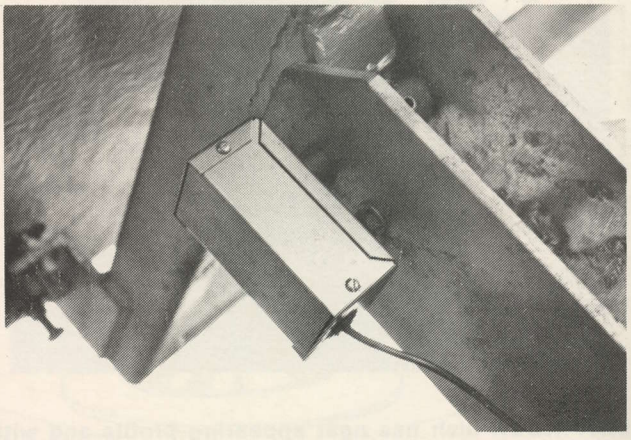
You align a well marked (on the blueprints) support strut on the tubular base with indicated north. That's a cinch because all of you to do is set a compass out there and sight the compass needle across the steel member welded onto the tubular support piece. Then after you get the antenna mounted on the support, there is an "all thread" adjustment that allows you to pull the north-south axis of the dish mount onto the true north. More about that later.

From set-concrete to antenna-mounted took two of us just over two hours. We had the steel in place, the five fiberglass pieces in place, the struts in place and the LNA and feed hooked up. And we stopped several times to drink some iced tea since it is summer down here and the white sand dunes are not that comfortable a place to work.

Now once you have the mechanical installation complete you go to work on the electronics. We equipped our dish with a DEXCEL 100 degree LNA at first, and trotted out an ICM receiver to do our signal searching. That's when we had to put our thinking cap on for the first time. The SatFinder is motor driven with a "Saginaw (jack) Screw". By taking out four phillips head screws the back of the motor drive pops off and a hand crank lets you run the Saginaw Screw. MacZura had given us implicit instructions on hooking everything up, calibrating the electronics, and then going signal searching.



LNA ROTATION functions with small (12 volt) DC motor, geared mechanism with field settable adjustment stops for appropriate vertical and horizontal rest positions. See text.



SENSOR POT attaches to dish with three wire control line that transmits "location" of dish inside to logic system mounted in control/display box.

will understand how antennas (and feeds and tracking systems) work.

2)**LNAs** - Bob Luly of Robert Luly & Associates began building his own TVRO LNAs several years back. He understands how to make them perform better (little tricks with the antenna feed system for example), how to make sure they go in right and keep on performing, how to detemine when one is bad, what precautions to take in powering them, putting on connectors and the whole nine yards. When you get done with this two hour session, you **will** understand LNAs!

3)**Receivers** - David Barker began building TVRO receivers shortly after the first SPTS; back in Oklahoma in August of 1979. In less than a year his home brew efforts were on the market as a line of commercial receivers. David thoroughly understands what makes a receiver work and not work; he is an excellent microwave engineer with the practical experience to back up (and often modify) the heavy theory that goes along with this complex subject.

Now none of these three will be 'selling' anything; except of course technology. Neither Gibson nor Luly have any commercial interests in their areas of expertise. Barker does have a pride-of-authorship interest in one of the popular commercial receivers in the marketplace, but he assures us that you won't be able to tell that from his presentation.

All three seminar 'courses' will take place on Friday the 14th. Our approach is simply that if you attend the three sessions you will be able to leave the first day advanced enough in the basic technology to ask intelligent questions and focus more clearly on the important elements of the system.

Then the real fun begins! Friday evening and all day Saturday we will be holding 'mini-seminars' in small group classrooms. Four rooms, just adjacent to the exhibit hall, are dedicated to groups up to perhaps 50 people in size and following a schedule, you will be able to move from room to room to talk "one-to-one" with experts in every part of this field. And, if there is sufficient interest in this aspect of the program, the 'mini-seminar' sessions will carry over to Sunday as well.

There will be some innovative use of television in covering SPTS'81 in Omaha. We'll have around 30 hours of programs for you on our SPTS Omaha channel on the MATV system. We have chosen in addition to the 12 hour lecture series of H. Paul Shuch, other 'basic' programs-on-tape from past events; covering topics such as antennas, LNAs and receivers. **PLUS** - on a **second channel** in the system there will be a mixture of live and taped coverage of the Omaha event itself. You will be able, on Saturday for example, to review the Friday lecture sessions of Gibson, Luly and Barker. You will also be able to 'sit in' on live 'mini-seminar' sessions going on **that day** and take home with you tape dubs of these sessions. This is the first time we have attempted '**live coverage**' of events, as they are taking place, and feeding them back into the MATV system.

And then there is the antenna measuring exercise. We have asked Taylor Howard to oversee this activity and we will be shooting videotape of the developments in the antenna lot over the course of Friday and Saturday. **On Sunday morning** Tay will chair a special session where the results of the antenna measurements and the taped segments shot during the two prior days will all come into focus. We recognize that few people will want to stay nailed to the parking lot for the full antenna check out exercises so we will recreate the highlights of the Friday and Saturday tests for you, and invite you to attend an '**Antenna Evaluation Session**' Sunday morning to see how it all came out.

Unlike past SPTS events, this one is on purpose 'loosely structured'. There will be no lack of scheduled affairs, but because many of them will be shown again on tape or live (so you can tape them) we hope that you will feel less restricted in your movements during SPTS and able to see what you really want to see.

At presstime there is every indication that the number of exhibit booths for Omaha will exceed the record breaking 80 booths of Washington. And as other sections of **CSD** reports this month, there will be perhaps more new technology on hand in Omaha than at any previous SPTS; all the way back to the first one more than two years ago! Oh yes...this post script. If you happen to notice a familiar looking chap with a delightful British accent wandering about the aisleways in Omaha don't pinch yourself more than once. Yes indeed; it really **could be** England's **Steve Birkill**!

TECHNICAL CORRESPONDENCE AND NOTES

ADM ANTENNA FOR SALE - Miami

I have one ADM antenna with the extension panels (13 foot total aperature), complete with mount and all of the hardware, for sale in Miami. I am asking $2400; or, best offer. The antenna is located at Satellite Supply, Inc., 2075 NE 154 Street, Miami, FL (305/944-1077). This antenna was shipped here to Belize and when it was assembled we found it was too small for this area; and was returned. At the $2400 price I will lose more than $1000. This is a typical example of the dealer not knowing enough about the field; this size antenna should never have been shipped here as it is just too small.

John Fuller
P. O. Box 109
Belize City, Belize
Central America

We understand your **frustration but you must realize that** (1)**very few people** know **what antenna size will** (and will not) **work in areas such as yours, and,** (2)**the April** CSD **very clearly suggested that anything smaller than a** five **meter was a waste of time and effort for any of Central America. John has well over $1000 in shipping charges involved here so hopefully somebody can take it off his hands, in Miami.**

2 INCH COPPER PIPE

Bob Luly's notes in the June **CSD**, concerning losses in 2" copper pipe used as waveguide, was very useful; this type of information is essential for builders of home terminals. The American system of different standards in different industries is an advantage in this case. A check with pipe distributors will reveal that **brass** tubing comes in different sizes than copper pipe. The nominal 2.25 inch brass tubing is available in varying wall thickness; i.e. .045, .035 and .032. These give ID's of 2.16, 2.18 and 2.186 inches. All of these are within the range suggested by Bob Luly and should make suitable waveguide.

D. H. Wilkins
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antenna, and the special LNA plus downconverter package will be kept in a locked container until the people responsible for the project are satisfied that it is OK to bring it out into the open. You won't be able to tell anything by looking at it however, and there will be an (armed) guard next to the antenna portion at all times. All of the display equipment, in the booth, will be treated in a similar fashion; locked cases, armed guards and the whole nine yards.

Now I know this sounds just a tad "James Bondish". Some of the decisions leading up to even getting the package to Omaha for display, make the security bit seem very amateur indeed. There was a bunch of international jetting and three day meetings to get us this far.

My own involvement in this whole scenario has been largely that of working out the Omaha arrangements so that the backers of the SCDN Terminal felt **comfortable** enough to come there and show it off. It should be re-emphasized that at this point in time, there is **no decision** on whether the equipment packages will even be offered in North America. However, if I read my mail and visits with dealers and distributors correctly, intense pressure on the SCDN folks should come at Omaha. I do know this. Only the most professional of 'installing distributors' will be considered to handle this equipment. Anyone who does not have the experience, personnel, and money to play in the big leagues will have a hard time getting in the front door. Knowledge of, and experience in, installing VHF **and UHF** coaxial cable distribution systems will be absolutely required. A good track record in installing high dollar TVRO terminals will also be a plus for you.

I don't know about you, but this whole project excites me a great deal. Perhaps a dozen representatives of under developed nations have been to Provo to see our existing **single channel** satellite fed VHF TV station network in the last year. Virtually all of them asked, at some point in the visit, how much more it would cost to add additional channels of service. The answer was always "too much". Until now. I can see the day, before the year is out perhaps, when I can lay upon my beach with a 12 volt battery operated receiver and tune across the dial to catch all of the satellite signals from a popular bird such as FI, with nothing more than a UHF 'wire loop' antenna connected to the battery operated receiver antenna terminals. If having truly portable satellite television with you, wherever you might go, does not excite you, then you are probably in the wrong business!!!

SPTS '81 OMAHA LIKE NO SPTS EVER BEFORE!

COMING DOWN TO THE WIRE

While it may seem like the recent Washington SPTS held in mid April is barely behind us, the dates for the forthcoming Omaha gathering are fast approaching. Most of us will gather in Omaha August 13th for the now familiar antenna set up ritual although the formal program will not get underway until 10 AM on the 14th.

The theme of SPTS '81 Omaha is 'Back To Basics'. That means we will be concentrating, as at no prior SPTS, on the nitty gritty business of making **all** installations perform at **peak** performance. This theme has been chosen because there are so many thousands of new people entering the industry, without a foundation in microwave or even television receiving antenna systems, that much of what the old timers take for granted as accepted practice has been lost on the new recruits.

To make this work properly we are putting on a trio of special two hour seminars. Each seminar 'instructor' has been chosen to lead his particular topic area because he has some unique experience in his field of talk. Each 'instructor' knows his particular topic area thoroughly and each has professional experience as a college level instructor. To back this up, the famous H. Paul Shuch basic technology lecture series (12 hours in all), from the early SPTS Miami show, will be shown through the Holiday Inn MATV system. You are of course invited to bring your own VCR with you and plenty of blank tape, if you would like to take home with you the Shuch series of 12 hours, or any of the other 'basic material' which will be sent to each room on the MATV system. Considering that the Shuch package of 12 hours sells for more than $200, getting this 'bonus' makes attending Omaha quite a bargain.

The instructors for the three basic seminars are as follows:

1) **Antennas** - Steve Gibson, author of the STT '**Gibson Satellite Navigator**' Manual. Steve is a serious student of antennas, and his past SPTS lectures have been exceedingly well documented with slides and graphic arts. When you have finished this two hour session, you

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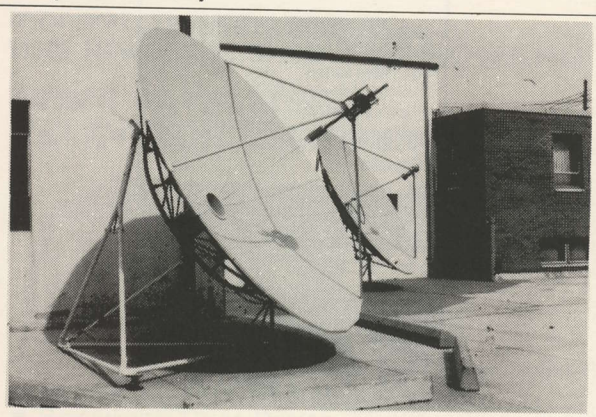

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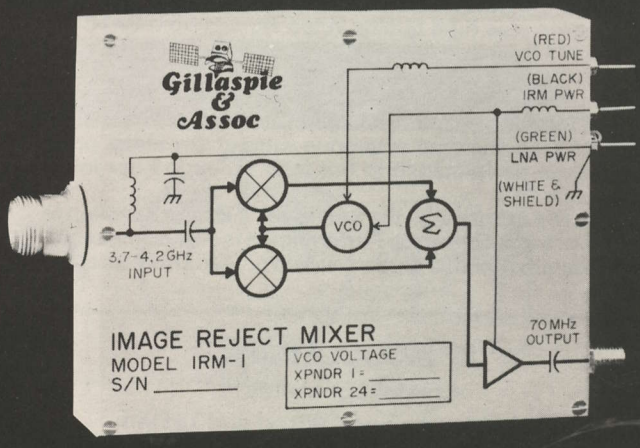

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TEN operational/control wires attach to back of user control box; two wires on far right are programming "jumper" which is used only at time of initial set up.

ience "glitch-proof", putting the system together and "tuning it up" to the point of novice use requires some extra skills. I have no problem with this since I believe this package will virtually always be installed by a professional; but the warning is there none the less.

My discussions with David MacZura, concerning installing a SatFinder down here in the Turks and Caicos, began with the electronics and mount **only** under consideration. Our past experience with an 11 foot ADM had shown us that while smaller antennas will produce pictures (W1 and W3 in particular) the results are marginal (close to threshold) at best. David felt that the expense of a SatFinder, landed here in the islands, could not be justified with a marginal performance system. I agreed with him, but felt that since we have a 'living laboratory' here the experience gained with a ten footer might be useful. Besides, with newer satellites coming on line soon the signal levels down here might pick up within a year or so. Thus the near flawless pictures on all WESTAR video transponders plus high quality video signals from SATCOM F2, COMSTAR D2 and useable pictures from ANIK-B were a bit of a surprise; a pleasant one at that.

Nothing about the SatFinder did not fit, go together properly, or perform the way it was designed to perform. The system survived a long shipping sequence without any major problems. And its performance in the field exceeded our initial hopes.

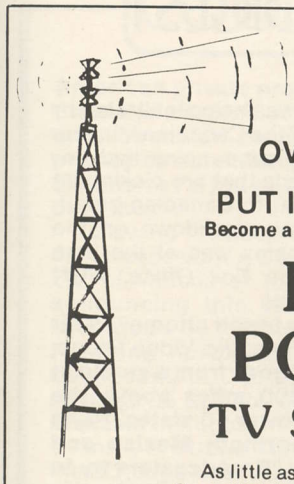
If there is a failure with the SatFinder, it is their devotion to the ten foot format antenna. Performance tests and measurements indicate that this particular dish comes about as close to achieving maximum theoretical gain (a Chaparral Super Feed is used) as anything on the market today. One of the SatFinder advertising lines suggests that you "Compare our 10 footer to **any** 13 foot dish". **Any** is a pretty big universe; but it does suggest that if SatFinder can put out a 10 footer that works as well as (some or many) 13 footers, that they might also be in a position to produce a 13 footer (for example) that would be as good as many of the 15-16 footers out there.

The ten foot decision came early with MacZura; with the performance he was getting in his home market area in the midwest, he saw no need to go to a bigger antenna. In the five section configuration it ships fairly easily and can be put together without any winch or lifting equipment, by two men. Larger antennas (even a 13 footer) might not get by with the same ease of shipping or assembly. Still, the demand for a high performance tracking antennna system of suitable size to perform in **Intelsat** reception areas is considerable. Nothing like that is on the market at the moment, although the demand is considerable.

The size decision aside, our other concerns are mechanical. The Saginaw Screw that drives the antenna has a maximum travel that limits the geostationary arc 'window'. In no location will the arm travel be less than the North American satellite arc; i.e. you **will** be able to cover the **full** arc from 70 west to 145 west with some room to spare on both ends. However, if you are located so you have signal-access to one or more birds located above the equator **outside of** the North American 'window', you will not be able to get **both** the **full** North American arc and the 'foreign arc' position(s) as well. Several people have suggested clever pivoting systems for the Saginaw Screw to allow it to be used **either for** North American viewing **or** foreign viewing; others have suggested a **pair** of Saginaw Screws, one for the North American arc and another for the (typically) more eastern arc devoted to foreign birds. The Saginaw Screw approach to driving a dish through the arc is sort of self limiting for purely mechanical geometry reasons and Hero Communications, for example, discarded the Saginaw Screw as a viable drive mechanism for their Super 'Tenna series for just that reason. Again, within North America, or where the available arc is within the reach of the Saginaw Screw, this is **not** a problem. But it does limit the user to a portion of his otherwise available 'full arc' in most locations.

Our other concern is with the preset nature of the vertical and horizontal LNA/polarization rotation system. A small DC motor drives the LNA plus feed; this is not your typical TV antenna rotator system. A collar and pin, adjusted to position with a large allen set screw, creates the system that allows you to align the vertical and horizontal **stops** to correspond to your own location. Unfortunately, as we have discussed at length in previous issues of CSD, as you rotate your dish through the arc the 'apparent polarization' of the incoming wavefront 'twists' or skews. A signal coming to you from a bird directly south of you (i.e. sharing the same longitude as you) will in fact have precise vertical and (or) horizontal polarization at your location. For birds east or west of you, the geometry of the system corkscrews the polarization(s) clockwise, or counter clockwise. The SatFinder design with mechanical stops for vertical and horizontal positions of the motor does not automatically compensate for this polarization skewing. In relatively strong signal areas, being 'off' a bit does not create any user problems since you have signal to waste anyhow. In marginal areas where the arc is wide across the sky (such as down here in the Caribbean) you can see this shift quite dramatically.

The usual practice would be to go to the middle of your orbit arc and adjust the collar pin stops for that region of the sky; then any error is spread evenly in both directions. However, when one of your weakest birds is located at the far end of the arc (FI in our example) this may cost you up to a dB in signal level at the edges. The alternate approach would be to favor the weakest birds with polarization 'match' and then suffer



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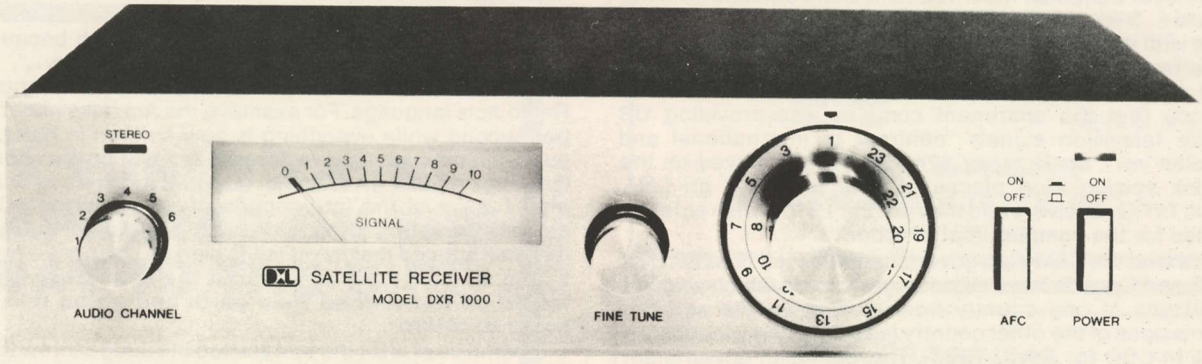

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the consequences on 'the other end' of the arc.

Finally, just for the record while SatFinder is sold as an antenna package, in their own installations in the mid-west and southwest SatFinder Systems utilizes an Avcom receiver and a popular brand of 100 degree LNA typically. Information on the system is available form SatFinder Systems, Inc., 6541 E. 40th Street, Tulsa, OK 74145 (918/664-4466).

CANADIAN TVROs HAVE THEIR DAY IN COURT

The battle to slow down or stop private TVRO growth in Canada has reached the courtroom stage.And TVROs have won a round although more battles are surely ahead.

Lougheed Village Holdings, Ltd. a Burnaby, BC apartment complex was charged on January 21st with two counts of violating the Canadian Federal Radio Act and one count of violating the Canadian Broadcast Act. The Canadian government felt the "test case" threatens the financial foundation and integrity of the Canadian broadcasting system. The maximum penalty for being found guilty of violation of the Radio Act is $2500 or 12 months in jail. The maximum penalty for being found guilty of violating the Broadcast Act is $1,000 per day fine.

The Royal Canadian Mounted Police and officials from the Canadian Department of Communications armed themselves with videotape recorders and installed themselves in an apartment in the complex in October of 1980. They videotaped all of the channels received within the complex as evidence that the apartment complex was providing US satellite television signals "contrary to international and Canadian law". On October 22nd the RCMP moved on the complex seizing nine pieces of gear including an LNA, various TVRO receivers and they put the 15 foot dish antenna installed for the complex "out of order".

In the trial the Canadian government took the position that the US and Canada have signed agreements which prohibit the citizens of one country from picking up the satellite transmissions of the other country (**see detailed discussion of this in** CSD **for April, 1981**). The Canadian government further took the position that Canadian citizens must have federal licenses to own and operate TVRO facilities. However the Canadian government refuses to issue such licenses if the terminal is used to receive and distribute **non-Canadian** signals/programs.

A Canadian Department of Communications radio inspector testified in the trial that **"Broadcasting frequencies** (i.e. local stations) **are intended for reception by the general public while satellite transmissions are not".** At the same time the Burnaby apartment complex was being infiltrated by Canadian investigators and the RCMP the Canadian Minister of Communications Francis Fox was announcing that any TVRO terminals "in the south of Canada that are picking up US satellite transmissions are a threat to Canadian broadcasters". He instituted a government crackdown on the practice. The Lougheed Village complex was at the time receiving the transmissions of Home Box Office, WGN Chicago, The Movie Channel and ESPN.

Testifying at the trial was New York based attorney Peter Gross, the General Counsel for the Time, Inc. Video Group; HBO. Gross told the court **"Our signal goes from a studio in New York City to a satellite 22,300 miles above the equator and then in a beam to the lower 48 states. Parts of the footprint cover parts of northern Mexico and southern Canada"**. Gross also noted **"Broadcasters try to get as large an audience as possible but we make our money by restricting our programming** (to paying viewers); **HBO does not accept advertising so we are not interested in a Canadian audience** (since we cannot charge for the service here)...". He concluded **"We are not in the business of trying to garner a large audience that is not paying; our name, Home Box Office, and our trademark have to be very carefully protected"**. Gross testified under Canadian law as an "expert witness" and he also told the court that "American law specifically prohibits the unauthorized interception of satellite signals".

Another U.S. witness, Eric Kemmler, a lawyer for ESPN, told the court **"ESPN programming is the property of the company and it is intended to be received only by other companies which have paid for that right"**. He also noted **"We view our programming the same way you might view a telephone call...no one is authorized to receive our signal unless we sign or are about to sign an agreement with them"**.

As the case wound on the question of why the authorities did not confiscate the TVRO dish antenna began to surface. The defense contended that without the dish being seized by the government the government had no case. The defense attorney noted **"The equipment confiscated does not meet the Radio Act's definition of...a reasonably complete and sufficient combination of distinct appliances intended for or capable of being used for** (illegal) **radiocomunication** (purposes)...". The government witnesses testified that they did not confiscate the dish because "...**it was five meters wide and sunk into concrete...**".

The defense also shot holes in several key elements of the Radio Acts language. For example, the Act talks about cycles per second while everything is now defined in hertz. A fine point, but one used by the defense to point up the antiquated language and intent of an Act adopted decades ago. The Act also speaks of the interception of **"radiocommunication signals traveling through space without a guide"**. The defense augued that the satellite signals are indeed **"guided"** by the satellite itself for **"without the satellite the signals would be transmitted from earth and go on into space never to return"**.

Several days after the trial started the Judge threw the case out of court. He said that he was not convinced that the Government had proven the electronic equipment taken in the raid on the 675 unit Loughead Apartment Complex was covered by the definitions of the Act under which the Government attempted prosecution. He noted that for the government to prove its case they had to show that satellite signals travel through space without artificial guide.

The Canadian government is now back to the drawing boards on the whole matter; they may appeal this specific case, they may look for someone else that does not have a fiver meter antenna sunk in concrete or they may ask the House of Commons to amend the language of the old Act.

One of the classic comments after the case came from British Columbia Provincial Communications Minister Pat McGeer. **"I hope the federal government does not appeal the case or seek new legislation that would promote**

Prepared from information supplied by:
Art LeMay
Hope, B.C.
Canada

American private profit interests and work a hardship on Canadian citizens. If they must send these signals down onto Canadian property, then they can maintain their privacy by scrambling the signals. If dishes were not so expensive I'd put one in myself and invite them to prosecute me!"

Following the decision Canadian "enterprise" popped out of the woodwork. A **CSD** advertiser, NU-West Video Systems, Ltd. of Vancouver told the Canadian press that "**we are announcing this summer a complete home terminal which can be "hidden" inside the wall of a house and requiring** no rooftop antenna **which federal "snoops" could spot...**". Doug Saxon of Nu-West expects the in-wall package to sell for around $2900 in Canada when it is available in August.

Finally in Ottawa, Minister Fox announced at the same time the BC judge was ruling against his department that "**We will no longer tolerate illegal earth stations picking up satellite TV signals from the US, in remote communities**". Fox noted that with the approval of a Canadian television service via satellite (see **CSD** for June 1981) he would expect all Canadian remote communities utilizing US satellite signals to "**switch over to Canadian signals as soon as they become available**". Previously Fox had attempted to crack down on **southern** Canada terminals but with the announcement of the new four or five channel Canadian service he was extending his area of concern to the north as well.

Actually, Canadian authorities have not shown any real concern for private or home terminals. Their primary concern has been systems installed on a commercial basis to serve apartment complexes and motels or installed in conjunction with LPTV devices to spread the US transmissions over whole communities. Most Canadian observers believe the Canadian authorities have **more** than they can handle legally and from an enforcement viewpoint, with the rapid growth of "illegal" commercial and community systems and will, at least for now, turn their heads the other way as far as private, home systems are concerned. One Canadian legal authority noted "**If the government cannot make the case against a commercial firm that is receiving and selling US satellite services hold up in court, their ability to bring judgement against a** private **family is virtually non-existent**".

A FUNNY THING HAPPENED ON THE WAY TO THE BIRD

A Strange 'Other World'

Since the first Russian Sputnik bird scared the pants off the western world more than 23 years ago there have been a number of amusing if not potentially disastrous events written into the history of satellite communications. Any admitted satellite 'junkee' needs a few of these strange-but-true stories to tuck away in the back of his mind for that special occasion when he needs to liven up a conversation.

Go back with us to the first HBO service, transmitted via SATCOM F2. While a few network programs were being shot

into the skies for 'tests' of satellite video communications, HBO provided the first 'scheduled' service on any bird available in North America. And because the service began in the east, the first programs were scheduled for the eastern time zone only on a single transponder. In those days finding a video event, on a bird, was a rare thing.

At about the same time HBO was starting to send out its evening program fare via satellite, the AT&T / GT&E folks were putting in their first COMSTAR (D1 and D2) ground terminals. The COMSTAR program was very new also, and the technicians who were charged with the responsibility of minding the COMSTAR uplink and downlink sites typically had two or even three huge dishes to monitor and aim. COMSTAR traffic was light and there was usually an antenna not in use at any given moment. And since AT&T did it 'right', the huge 11 to 15 meter antennas were motor driven so that in any emergency they could point at virtually any spot in their geo-stationary arc.

It was not very long before a smart COMSTAR technician, charged with minding the downlink/uplink station during the evening hours, discovered that he could move one of the big antennas to the 119 degree slot and tune up a spare receiver to vertical transponder 17. That gave him the HBO movies and sports to pass the evening with. In short time it became quite a sport for the COMSTAR techs to engage in this activity at night. In fact, it became so commonplace that watching HBO at night became the 'normal way' to pass the evening away.

It became so commonplace that the COMSTAR techs got sloppy. Rather than carefully moving their big dishes back to the appropriate COMSTAR heading when HBO went off for the night, they began simply leaving their spare dish on F2. A supervisor or two noticed the strange headings the next day and told the night tech to cut it out. But people will be people and in the dark of night the big dish would drift to the F2 slot.

And then, there was an emergency test check out one day and without warning a call went out to a COMSTAR terminal to activate a standby transmitter and the spare antenna. This test procedure was designed to test how long it would take the COMSTAR terminal to replace a failed local uplink transmitter with a standby unit, using a standby antenna. When the surprise order came a tech who was engrossed in an HBO movie sprang into action. Following a check sheet he fired up the standby transmitter and switched it to the standby antenna. Uplink signals shot into the big dish and on they went into the sky. Directly into F2. **And right on top of HBO.**

Without remembering he was pointed at the wrong bird the COMSTAR tech had managed to wipe out the HBO service from coast to coast on transponder 17!

Now it didn't take RCA very long to figure out what happened and there were high level meetings with the folks at COMSTAR. Now the command came down from the COMSTAR headquarters; no more moving of antennas to F2. **No more watching of HBO.**

Well, people will still be people and after a few weeks old habits came back. It gets mighty lonely sitting in a COMSTAR terminal watching meters bounce back and forth in the middle of the night. And the whole sequence repeated itself again. An emergency test, a rapid response and bamm! **There went HBO once again.**

This time the COMSTAR hierarchy decided that a new procedure was in order. When you are AT&T and you have a guaranteed "rate of return" simple problems like this can turn into complex technological pursuits. A new electronic system was designed and installed on **each antenna** at each COMSTAR site; a system that transmitted a 'signal' back to COMSTAR headquarters each time any dish was moved off ot its pre-set position (i.e. a COMSTAR position) to any other position in the sky. Now, no longer could a tech wander about the sky with a dish without alerting somebody else that he was 'playing'. And then, to top it off, a chart recorder system was installed at each site that produced a permanent record of the antenna's location 24 hours a day, 365 days a year. If a clever tech dis-abled the 'alarm' system, the chart recording which would be reviewed by a superior at some stage in life would give him away!

An so we end the saga of COMSTAR techs tuning in HBO programs. The ultimate security system!

Satellites are common carriers. That means they, like the telephone service, are available to **anyone** who is desirous of using the service, and, who is willing and able to pay the fee. The only way RCA or Western Union or COMSTAR can turn you down, if you walk into their office and ask to buy satellite transmission time, is if they are 'full'; i.e. have no transponder 'time' left to sell. Furthermore, the rates they charge are established by tariff. That is, fee schedules proposed by the 'carriers' and on file with the FCC are cast in concrete. **If you are willing** to pay the fee they have on file with the FCC, a fee that has been approved by the FCC, they **must** take your money and transmit your message (again, assuming transponder 'time' or 'space' is available).

Several weeks prior to Christmas, in 1976 or so, a lonely man walked into the RCA Americom offices in New York City. "**I wish to purchase one hours time on your satellite**" said the man.

"Any particular hour?" asked the RCA Americom sales person?

"**Yes, on Christmas eve at 10 PM**".

The RCA man pulled out a service order form and took the man's name and address. "This will cost you $1800" he said. The man pulled 18 crisp, new $100 bills from his pocket.

"Now, where do you wish to send the message?" he asked the customer.

"**To God**" was the response.

The RCA man, a veteran of communications, did not blink. "OK...g o d" he wrote on to the form.

"**Actually, that should be** G o d**...the G is a capital letter**" corrected the customer. The RCA man smiled, and erased the small g and replaced it. G.

'Now where will God be on Christmas eve?" asked the RCA man.

"**Why, he will be everywhere!**" responded the customer, somewhat indignantly.

"Yes, I understand. But we have to place a receiving point on this form. We have receiving terminals in Los Angeles, Chicago, Houston...".

The customer grew ashen. "**I am afraid you don't understand. I want this message to go directly to God. In space. Doesn't your satellite operate in space?**" he asked.

The RCA man assured him that everything he had heard about the satellites was true. They were in space. "But, we transmit from earth to space and then the satellite turns the mesage around and sends it back to earth".

The customer was bewildered. "**Oh no, that will not do! I want this message to reach God in far away space. Far beyond the satellite**".

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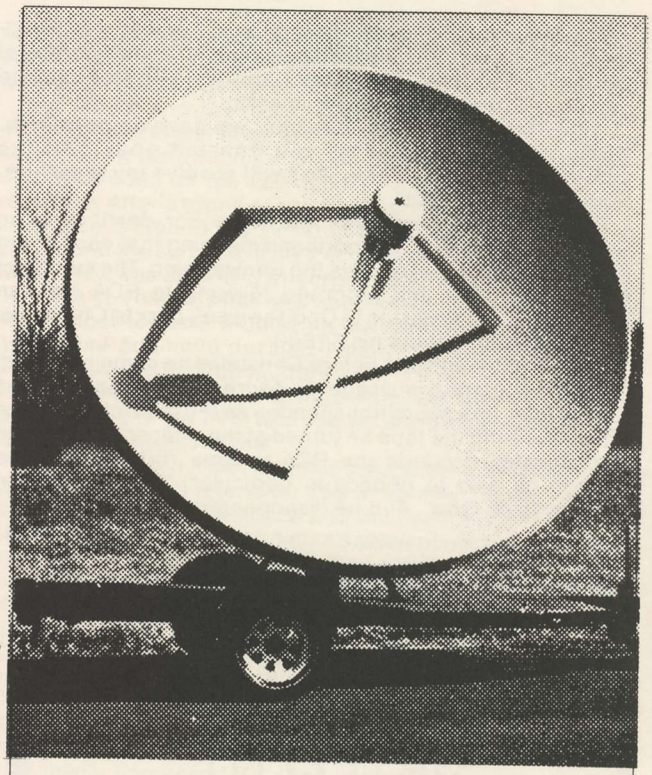

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The RCA man re-explained the system. A powerful transmitter on earth sends the message into space. A small portion of the energy transmitted from earth is captured by the satellite and turned around, sent back to earth.

"**Well then**" smiled the customer "**we have no problems. Since most of the energy you transmit goes past the satellite into deep space, God will receive my message. Here is your $1800!**".

The RCA man completed the form. For destination he penned in "All points", a shorthand meaning that each of the RCA terminals would receive the transmission. The customer signed the order and promised to bring to RCA his own videotaped 'transmission to God' the week prior to Christmas. He left, leaving behind his $1800.

And sure enough just before Christmas he came back with his one hour taped message. And sure enough the tape was run, by RCA, on a spare transponder. As the man left the office after delivering the tape he turned at the door and spoke one last message towards the RCA person. "**When will I be back?**" he said to nobody in particular. "**When I get an answer from God**". And he disappeared into the night.

SATELLITE POTPOURRI

THE OTHER SIDE OF NO WHERE

Taking television into areas where it has not previously been available has long been a passion of mine. I did it first as a wee lad of 12 or so when in upstate New York, just outside of Ithaca, I became intrigued with distant TV reception and proceeded to build a huge (wire) rhombic antenna array to drag in 120-150 mile reception from stations in Rochester and Buffalo. Not satisfied to keep them to myself, I built a cable television system using home made ladder line and eventually fed many of our less fortunate neighbors with TV. That was 1950 or so.

One of my favorite 'TV to no where' stories involves a fellow down in the Pecos Valley region of west Texas. Some years ago he was buying VHF translators from Oliver Swan (the father of the low cost spherical TVRO antenna) and carrying them down to the innards of Mexico. One job, out on the Yucatan Peninsula, involved taking two high band TV channels off the air at a distance of 300 miles or so (you can do that in Mexico when the TV signals travel over the lower gulf for that distance, and, the transmitters are on a 13,000 foot mountain!), converting them to a pair of low band channels and retransmitting them over a small community. This chap worked for days on the installation, and then the Mayor was invited over to throw the switch. Now my friend was a little on the careless side, and he was relying on a field strength meter to tell him he had off-air input signals and to indicate the translators were putting out power. He had never actually **looked at** the pictures very long and when he did it was for only a few seconds to verify the color quality. Since English was his first language, and Spanish was a poor second, he

never bothered to crank up the volume on the TV audio. The meters read OK, the pictures looked great so he stuck to wiring up cables and installing equipment.

The Mayor and the local officials arrived, inspected the installation, and marveled at the high quality color. Then the Mayor threw the switch turning on the translators and everyone applauded as the low band TV channels lit up on the receivers. After a round of short speeches the Mayor and his chief aide drifted to the TV set to turn up the volume. To his shock, and the surprise of my Pecos Valley friend, the man on the screen was speaking English. It took my friend about ten seconds to realize what was happening. The Mayor took a little longer to come around. As the minutes dragged on he grew more and more puzzled. Finally, he turned to his aide and in flawless English muttered:

"You see, you hire a Gringo to bring you TV and he brings you Gringo TV. I told you we should have hired that fellow from Mexico City!".

Fortunately, the freak weather conditions that were bringing Corpus Christi television 750 or so miles down the Gulf went away after a few hours, and the expected Mexican TV stations (a mere 300 miles distant) came booming in, after the interference went away. I've written about this episode previously; some 8 years or so back, shortly after it happened. I was reminded of it recently while showing off the new SatFinder ten foot dish we got installed here in the Turks and Caicos during late June. Shortly after it went in a contingent of visitors from some French speaking islands here in the Caribbean dropped in to see my satellite television fed television system. I ran through the usual 20 or so active transponders on FI, with the big 5 meter dish, and they were only mildly impressed. Courteous would be a better word. One clearly liked American TV; the others carried on in French about the sex and violence and commercials. I understood just enough to piece together what I was doing wrong. So I invited them outside where I still had a temporary monitor hooked up to the SatFinder. On purpose I started on WESTAR 3 and worked my way west. I could see I was not making many points. Then I dropped in on ANIK-B and ran through the English channels; skipping the CBC French feed, on purpose. Then I set them up.

"Well, what do you think?" I asked. The leader thanked me for my time and a round of handshaking ensued. I waved goodbye to them and just as they turned to leave I spun to the CBC French feed and cranked up the audio. All four stopped dead in their tracks and bolted back to the monitor. Broad smiles followed and they sat in a trance for the full balance of the program. I wandered off to get some iced tea and they never even noticed me leaving, or returning. When the program was over, and the CBC French network had identified itself, they broke out in a chatter amongst themselves. Pretty soon they were slapping each other on the back and then whipping my hand up and down in great excitement.

After that I had to drive them away with a stick. I mentioned the French TV programming available on SPN (WESTAR III) and the reports I had heard of Symphonie now using a 'Global' pattern to feed **real French TV** to a couple of spots in the Caribbean. In no time at all they had it all sorted out and were hurrying off to their private airplane to wing home. I suspect that before the summer is over they'll have a couple of terminals in and operating, bringing native language television to their own islands.

Television. Sometimes it is not the quantity that counts; but rather the content. You might keep that in mind as you show off your own TVRO system receiving packages!

ANTENNA FEEDS

I would like to try to clear up some misconceptions about feed antennas and the aperture efficiency. There seems to be some confusion about the effects on microwaves traveling through dielectric materials that propagate energy at different

phase velocities, microwave energy traveling through a dielectric will also undergo a change in phase by traveling from air through the man made dielectric and back to air again.

This phenomenon is made use of in some of our own antenna feed systems to create a desired phase shift by forcing the microwave energy to travel through a dielectric-filled waveguide. Dielectric parts inside of a waveguide will also have an effect on the characteristic impedance of the guide, attenuation, and guide wavelength.

The other interesting effect which can be demonstrated with regard to dielectric materials and microwave energy is the reflective properties. In simple terms, the percentage of energy striking a dielectric plane which will be reflected from it is dependent on the angle of impingement, the frequency, the physical characteristics of the material itself and also the polarization of the wave. In other words plastics do have an effect on microwave energy, although for our purposes the effects can probably be ignored in most situations unless the material is positioned inside of or in very close proximity to a horn or a waveguide.

David J. Yanko, President
Tristar General, Inc.
Cleveland, Ohio 44131

Many feeds, including the Tristar HEF series of feeds for Spherical antennas, include a 'plastic' cover plate over both the horn opening as well as the waveguide flange to which the LNA bolts. One presupposes that since Yanko understands the effects of plastic on microwaves that his use of the material in no way detracts from the performance of his firm's products!

HEAT

I would like to add my comments to your informed speculations on the future course of LNA development. It is clear that moving the first downconversion function to the LNA enclosure results in a less expensive overall system. Not only can common (low cost) 75 ohm coaxial cable be used for the run indoors, but as you point out bulk down-conversion adds a savings when several demodulators can share the same LNA/front end. This occurs since the relatively expensive (first) local oscillator and mixer in each receiver is replaced by one (shared) system in the LNA.

However I do not believe that "everything at the dish" is the best alternative available to designers. Granted, one simple package is an elegant solution but there are numerous problems with this approach. I believe the majority of private installations will require LNA rotation to receive both polarizations and this fact constrains the size, shape and mechanical configuration of the one peice "everything at the dish" system. A more serious constraint is that packaging the power supply in the same weatherproof package may cause excessive heat retention which can seriously degrade the performance of the LNA.

What if the power supply is placed into a separate box? Then, I believe, it would be cheaper to use a standard cabinet inside and run a DC power line bundled with the RF feedline to the outdoor unit rather than run a (UL approved) 120 VAC conduit out to the dish. I would like to hear other industry response to this speculation, especially with regard to motorized dish installations.

Once the design is advanced to **both** indoor **and** outdoor units, then I believe the downconversion and possibly channel selection functions might best be left at the dish to minimize the size and heat retention of the more expensive outdoor enclosure. Alas, if channel selection is left at the dish then everyone downstream must watch the same transponder.

Finally I suggest that present LNA manufacturers do not have a consumer orientation and are open to effective competition from **CSD** readers who can create less expensive alternatives to the present military style design and pricing strategies.

Stephen L. Reed
Global TV Electronics, Inc.
Maitland, FL 32751

Back some years ago everyone worried about LNA heat. It is true that when GaAsFET and other 4 GHz operating devices are exposed to heat their performance curves degrade. If you can cool (as in reduce the operating temperature) **of the LNA GaAs-FET stages to say 0 degrees C, you can expect better performance** (it works out to about 0.5 degree K noise temperature reduction for each degree C that you reduce the environment for the GaAs-FETs). **This fact prompted numerous people to experiment with solid state cooling techniques for LNAs. They found, universally, that the trade offs were monstrous. It took several amps of DC current delivered to the solid state cooler bolted on or over the LNA enclosure to produce any kind of noise temperature reduction. The bulky housing got in the way and the DC current requirements of the cooler were not insignificant. More recent developments in thermo-couple solid state spot cooling techniques may offer new hope and perhaps the whole subject is ready for a review. Just getting the LNA out of the bright sunlight will help some; a simple fiberglass or styrene 'hat' fixed over the LNA as an 'umbrella' takes only a few minutes time and can produce measureable improvements. Many of the new antenna sytems submount the LNA plus feed inside of a PVC tube at the focus point. This effectively shades the LNA as well.**

SATELLITE TV IN NEW PROVIDENCE?

Rick Towers of Jim Towers TV in Clearwater, Florida recommended we contact you regarding some investigative work we are now doing. We are looking into the possibility of installing satlelite TV distribution for the New Providence area in the Bahamas and we understand you have done a similar thing down in the Turks & Caicos. Please let us know how we can get together.

C. F. Wreath
Keller-Wreath & Associates
Tarpon Springs, FL 33589

A group of us plan to meet in the Miami area late this summer. Invited are people with an interest in making satellite TV 'work' throughout the Caribbean, Central Ameria and northern South America. Anyone who thinks they would like to attend should contact Bob Behar at HERO Communications (1783 W. 32nd Place, Hialeah, FL 33012; 305-887-3203) **and we'll let you know the exact dates and when to be where.**

TECHNICAL CORRESPONDENCE AND NOTES

KLM's SKY EYE I SYSTEM makes it easy!

It used to be that putting together a TVRO system was a big job; hustling a downconverter here, and LNA there, a dish from who knows where . . . then synchronizing delivery dates, and finally, getting all that diverse equipment to work together.

Getting the whole system up and running in one shot can save you time, money, and a lot of headaches . . . and it's possible **NOW** with KLM. Our **SKY EYE I SYSTEM** is *complete*; with 12 ft aluminum dish (or 16 ft screened), pedestal and AZ/EL mount, our own M120K LNA (spec'd at 120K *or better*), polarity rotator, weather cone, cables, and last but not least, the popular and reliable Sky Eye I Receiver. The **SKY EYE I SYSTEM** is designed to interface perfectly and produce beautiful, razor-sharp picture and sound. Best of all, delivery is running 30 days, A.R.O.

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The Sat-tec R2B receiver is our latest full feature receiver, tailored to commercial equipment specifications at a price you can afford. the R2B's single board construction eliminates problematic interconnections and innovative utilization of all components results in a reliable and proven design. Operation is simple—a single tuning knob does it all, and our unique Channel-Lock AFC keeps the tuning sharp and accurate. A new feature is our variable audio tuning to give you complete selection of all subcarriers—without the use of additional plug-ins or devices. This, together with the R2B's full frequency coverage makes it truly compatible with all domestic and international satellites.

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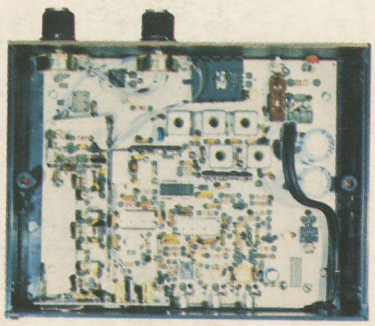

SPECIFICATIONS

Frequency range:	3.6-4.3 GHZ tunable
Audio range:	5.2-7.6 MHZ tunable
Threshold:	8db CNR
IF bandwidth:	30 MHz for full fidelity video
LNA power:	15 volts regulated for up to 2 LNAs
Outputs:	Standard one volt audio and video, compatible with VCRs, monitors and modulators
Optional:	BC-1 RF modulator kit, tunable channels 3-6 with sound

Sat-tec Systems
div. Ramsey Electronics, Inc., 2575 Baird Rd., Penfield, NY 14526, 716-586-3950